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Minnesota Plant Press

The Minnesota Native Plant Society
Newsletter

Volume 18, Number 1

Fall 1998

Upcoming Monthly Meetings

Minnesota Valley National Wildlife Refuge
Visitor Center, 3815 East 80th Street

Bloomington, MN 55425-1600 612-335-2323

6:30-7:00 PM—Refreshments, Room A
7:00-8:30 PM—Program & Society Business
8:30 PM—Socializing
9:30 PM— Doors close sharply at 9:30 PM

Programs

October 1

Native American Horticulture in the Upper Midwest, Michael Scullin, Mankato State University

November 5

Seed Certification, Beth Nixon

December 3

Aspen Parkland: Minnesota's Least Known Landscape, Bob Dana

Plant-of-the-Month:

Cooper's milkvetch, by Nancy Sather

There is no meeting in January

MNPS Web Site:

<http://www.stolaf.edu/depts/biology/mnps>

Deadline for winter issue is December 15, 1998

Conservation Planning of Native Plant Communities in the Coulees

by Ken Kailing

Land planners are beginning to accept the well-substantiated principles of ecologists Dasman, Kormondy and Odum who determined the proper scale for conservation actions to be landscapes, ecosystems, and habitats. Recent attention to habitat conservation stems from both the need to conserve biodiversity in the ecosystem and society's changing perceptions of what species loss is acceptable. Clean air and water, scenic beauty, and open space are also prized for health and sustainability of human settlement. Biodiversity refers to the relative abundance of various organisms, their evolved placement within ecosystems (niche), and the genetic opportunities inherent in their populations (Stearns). Species loss is natural but the current rate of extinction outpaces rate of speciation according to Wilson, and it is alarming. The viability of a species depends on its genetic variation, which enables a species to adapt to changing environmental conditions. Viability declines rapidly when a species is confined to small populations within fragmented landscapes. We humans are rapidly causing this fragmentation and decline in species diversity, and thereby we are destroying our own home. As human beings, we are at once dependent on natural ecosystems and culturally removed from them so that the relevance of biodiversity becomes shadowed by economics. We need an "ethic" to place us back within our natural landscape as responsible stewards and encourage us to be good citizens in a whole community of the land (Leopold).

The proper way to view habitat conservation is to seek our role in the community and see how we treat land, and how this land use affects natural processes. When ecological processes are relatively stable and certain species selectively vulnerable, we can study effects on key individuals and adjust land use accordingly. The species-by-species approach, however, is cumbersome. We can't measure and equate effects on thousands of species within such a diverse planning area as the Root River Valley, or even a few hundred species sensitive to human activity. The Nature Conservancy (TNC) developed the concept of making a coarse and fine filter inventory (Noss). When we identify the highest order native plant communities within a region in relation to known supportive landscapes and natural history and manage these within contiguous tracts, we will capture and conserve most of the native species.

(continued on page 2)

Conservation Planning of Plant Communities (from page 1)

Species not well protected by the coarse filter approach require the fine filter and individual attention. Mostly, I accept the TNC model for habitat conservation and use it to identify and evaluate native plant communities, or to include it in a hypothetical habitat conservation plan for Lower Root Valley. I say hypothetical because, at present, we who work with native plant community conservation in the southeast Minnesota coulees are not getting the needed support. And this is why I have come to speak to you: to tell you about the exceptional landscape of the Coulees, to invite you to come take a look, and perhaps even persuade some of you to join our cause.

The Natural Heritage and Non-Game Research branch of the Minnesota Department of Natural Resources has given us some fine tools to assist our local community conservation planning and we have 2 superlative Scientific and Natural Areas (SNA) to use as models. One of the DNR tools is the County Biological Survey for Houston and Fillmore Counties. Another useful tool is the new *Sourcebook of Natural Areas* from DNR that contains specific protection methods including acquisition, conservation easements, and purchase of development rights, and, model ordinances, financing methods, and management considerations. The 2 SNAs are Mound Prairie containing dry and dry-mesic prairie, dry oak and associated oak savanna on 3 steep, majestic ridges overlooking the Root River floodplain; and the Rushford Sand Barrens containing a complex of rare plant communities on a dry, sandy site below the south bluff of the valley. These sites serve as prototype high-order, habitat models and are protected exclusively for scientific study. I will point out Mound Prairie SNA as the key habitat feature within our planning area at the lower end of the Root River. This site is already protected and serves as an anchor for attaching adjacent high-value plant communities in a broad based conservation plan.

I want to give you a wide-angled view of our beautiful Root River landscape, but from an ecologic perspective. The ecologic substance is what provides lasting beauty. We must, therefore, begin with the main geologic episodes and climatic changes that have shaped the sedimentary rock formation underlying our biota and the dynamic sequences of plant colonization over millions, then thousands of years. Next, we need to look at the comparatively abrupt European settlement with its catastrophic effects in the mid-1800s. Then follows a pattern of exploitation and harm through to the awakening in land reconstruction of the 1930s, and up to the somewhat tenuous conservation land use formula of today. We need also to appreciate what we have left of our presettlement biodiversity as the natural resource base we want to save.

We are in a contest. Demands on our natural resources are great. We may lose the battle to sustain our remaining native plant communities in southeast Minnesota. Those of us who appreciate the value of diverse landscape in the coulees must try to win the battle—we owe it to ourselves and our children. So, as Aldo Leopold said, the first step is to identify the important pieces. The natural landscape is like a finely stitched quilt, with many intricate patterns. With study, we acquire a sense of the patterns that fit and those that do not. We can help educate our neighbors and even prevail upon them as good citizens to correct some of the community fragmentation and species displacement. By participating in this community conservation process, we will become the lasting stewards of our most valuable asset—the true biodiversity of our home land. I can't tell if conservation planning is going to work in the Root River Valley, but I can show you why we need to attempt it when you visit Mound Prairie.—Talk by Ken Kailing at a MNPS meeting, April 2, 1998.

The Minnesota Native Plant Society

Minnesota Plant Press

Thor Kommedahl, editor

University of Minnesota, 495 Borlaug Hall, St. Paul, MN 55108; 612/625-3164 (work). E-mail thork@puccini.crl.umn.edu

Membership dues are \$12 per year for regular members and includes subscription to the newsletter; dues for students and seniors are \$10, for family \$14, for institutions \$20, and donors \$25. Checks can be made out to: Minnesota Native Plant Society, and sent to: Minnesota Native Plant Society, 220 Biological Sciences Center, 1445 Gortner Avenue, St. Paul, MN 55108.

Four issues are published each year.

MNPS Board of Directors

President: Gary Perrault, 2229 Margaret St. North, North St. Paul, MN 55109; 651-773-9207; e-care@usa.net

Vice-President: Bill Capman, Department of Biology, Augsburg College, 2211 Riverside Ave., Minneapolis, MN 55454. (612) 330-1072; capman@augsborg.edu

Treasurer: Pat Ryan, 9016 Kimbro Ave. South, Cottage Grove, MN 55016; 651-459-8554.

Secretary: Jackie Buffalow, PO Box 662, Mendota, MN 55150-0662. (612) 423-2011. secretary-mnps@mn.state.net

Deb Anderson, RR 1, Box 152, Chatfield, MN 55923; 507-867-4692 (home)

John Buffalow (see address for Jackie) johnbuff@mn.state.net

Virginia Card, 3005 E 25th St., Minneapolis, MN 55406. 612-696-6425

Dave Crawford, 4051 Gisella Blvd., White Bear Lake, MN 55110; 651-653-4385 (home), 612-583-2925 (work); birch7@main.goldengate.net

Gerry Drewry, 24090 Northfield Blvd., Hampton, MN 55031; 651-463-8006; 612-460-6755 (home)

gdrewry@pioneerplanet.infi.net

Joel Dunnette, 4526 CO RD 3 SW, Byron, MN 55923; 507-365-8091

Thor Kommedahl – address above.

Catherine Reed, University of Minnesota, Department of Entomology, 219 Hodson Hall, St. Paul, MN 55108. (612) 624-3636; reedx012@maroon.tc.umn.edu

Andy Sudbrock, 4316 45th Ave. S., Minneapolis, MN 55406. 612-722-9467

The Minnesota Native Plant Society is a tax-exempt 501 c3 organization as determined by the US Internal Revenue Service.

Society news

•Directory of Members

Attached to this newsletter is the new directory of members, which was prepared by Marcie O'Connor, and we appreciate her efforts in making this an excellent directory. She reminds members that the code for the east metro area will change to 651 (from 612) as of January 1999. Marcie changed the area codes in this mailing list to reflect that change. If errors have been made, please contact Marcie O'Connor at 651-645-2043 or by E-mail: marcie@haven.com.

•Editorship change for 1999

Gerry Drewry will be the new editor, and Catherine Reed will be the next publisher of the *Minnesota Plant Press* starting in 1999.

•Program Committee

Catherine Reed has been planning programs for MNPS and will be succeeded by Dave Crawford with assistance from Virginia Card.

•**Membership and Outreach Committee** reported membership as 280. MNPS was represented at the Minnesota State Fair.

•**Refreshments.** Volunteers are needed for refreshments at regular meetings. Please sign up.

•**Display Board.** If you wish to use this MNPS display board, contact Don Knutson, 612-721-6123 (work) or 612-379-7314 (home).

•**Web site.** Charles Umbanhowar manages the MNPS Web site and welcomes articles at HYPERLINKmailto:ceumb@stolaf.edu, or by E-mail at ceumb@stolaf.edu

•**Error in Web site last issue:** The "www" was omitted from the URL on medicinal plant drawings.

Stalking The Wild Amaranth: Gardening in an Age of Extinction, by Janet Marinelli, published by Holt, in 1998, for \$25, is now available in bookstores.

Population Biology of *Sedum integrifolium* ssp. *leedyi*

by Joel Olfelt

University of Minnesota

Leedy's roseroot (*Sedum integrifolium* ssp. *leedyi*) is a cliff-dwelling plant with a discontinuous distribution. The only known Leedy's roseroot populations are in Minnesota and New York. In southeastern Minnesota, there are 4 populations of fewer than 750 plants each, and in upstate New York (Seneca Lake) there is a population with more than 6,000 plants. Leedy's roseroot is on the endangered species list in both states and on the federal threatened species list. Its genetic relation to *S. integrifolium* spp. *integrifolium*, ssp. *procerum*, and ssp. *neomexicanum*, which grow at high elevations in western North America, are not well understood. Parts of its life history and genetic relationships among populations are largely unknown. The lack of such information is important because managers need to set conservation priorities and to make management strategies. We used DNA fingerprinting, morphology in a uniform environment, and germination and developmental studies to test the distinctiveness of Leedy's roseroot from its relatives and to investigate clonal and sexual reproductive characteristics. We found that Leedy's roseroot is distinct from its close relatives with distinct populations. It reproduces readily from seed, and flowers within 6 months of germination in the greenhouse. In the field we found little evidence of clonal reproduction, and significant differences in flowering rates among populations. We found that the population with the lowest flowering rate in the field had the lowest rate also in the greenhouse. We conclude that Leedy's roseroot merits protection under the Endangered Species Act and that establishing a gene bank using seeds is feasible. The only formally protected Leedy's roseroot population now has the lowest seed germination and flowering rate and may be experiencing genetic or environmental stresses. We believe that other Leedy's roseroot populations should be protected to conserve this taxon.

Presented May 7, 1998, at MNPS meeting

Plant Lore

What is goldenrod?

Goldenrod, a composite, is the name for species of *Solidago*; 15 native species are listed in Minnesota by Ownbey and Morley. These species and asters announce the coming of fall.

Where do goldenrods grow?

Most are native to North America: by the sea, in fields, in swamps, and in open woods. Since they are perennials, they can be seen in colonies as clones which may be up to 30 feet across in prairies and may be 100 years old.

Can hayfever be attributed to goldenrod?

Not likely. Reportedly only 1 to 2 percent of the airborne pollen in August is goldenrod pollen. Most of the hayfever in fall is caused by common and giant ragweed.

Both flower in August, why are they not equally guilty?

Goldenrod is insect pollinated, whereas the ragweeds are wind-pollinated. Goldenrod pollen is sticky and adheres to insect bodies.

Why are insects interested in goldenrod?

They produce much nectar and pollen that attract bees, syrphid flies, soldier beetles, longhorn beetles, and even ambush bugs to feed on the insects. Flies, moths and midges make galls. Tree-hoppers and goldenrod beetles feed on leaves. The tree-hoppers, in turn, attract ants to form a mutual relationship.

Does goldenrod have medicinal properties?

Solidago canadensis contains quercetin, a compound used to treat hemorrhagic nephritis. American Indians used the root for burns; flower tea for fever and snakebite; and crushed flowers for sore throats.

Are goldenrod species easy to identify?

No, there are hundreds of species and varieties in the USA, and some hybridize with others making identification difficult.

Minnesota Native Plant Society
University of Minnesota
220 Biological Sciences Center
St. Paul MN 55108

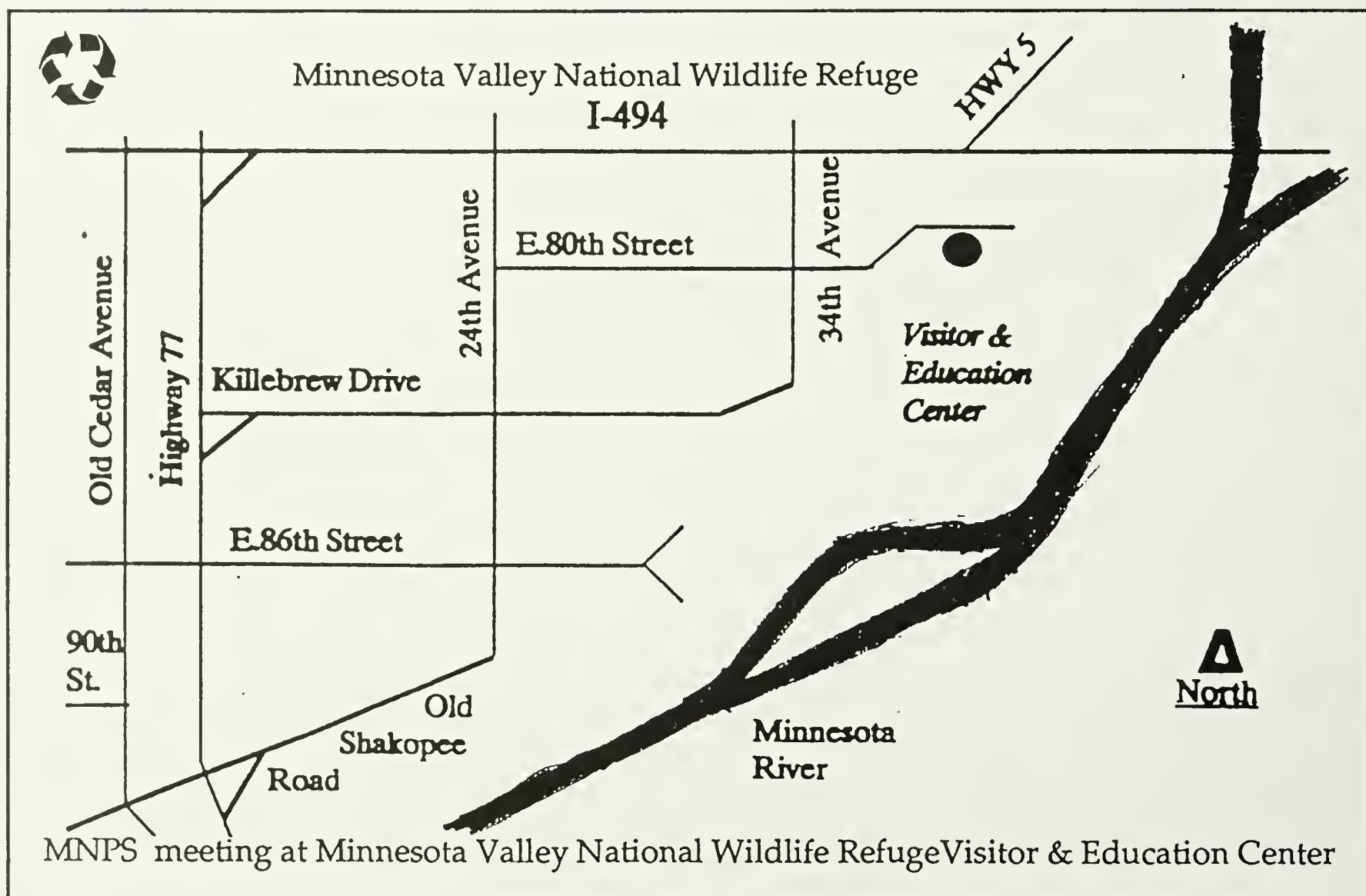
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Winter 1999

Upcoming Monthly Meetings

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6:30 - 7 p.m. — Refreshments, Room A
7 - 8:30 p.m. — Program and Society Business
8:30 p.m. — Socializing
9:30 p.m. — Doors are locked at 9:30 p.m.

Programs

February 5

"Prairie Passage," Lawrence Puchalski, MnDOT. Prairie Passage is a proposed network of tallgrass prairie preserves.

Plant-of-the-Month:

New Jersey Tea, by Douglas Owens-Pike

March 4

"Native Plants in Agriculture," Don Wyse, Executive Director, Minnesota Institute for Sustainable Agriculture. Plant management for landscape diversity.

Plant-of-the-Month:

Linnea borealis, by Nancy Albrecht

April 1

"Bryophytes and their contribution to plant ecology and biogeochemistry,"

Eville Gorham, University of Minnesota.

Plant-of-the-Month:

Butternut (*Juglans cinerea*), Kent Honl

May 6

"Spring Peeper Meadow: a Sedge Meadow Restoration," Julia Bohnen, Minnesota Landscape Arboretum.

Plant-of-the-Month:

White Cedar, by Meredith Cornett

June 3

Landscaping with native plants, three speakers. **Plant sale**

MNPS Web Site

<http://www.stolaf.edu/depts/biology/mnps>

Deadline for spring issue: March 15, 1999

Minnesota Prairies As Seen by Joseph Nicollet

Transcribed by Charles Umbanhowar, Jr.

Brief Introduction

The following is a transcription of the English translation of part of Joseph Nicollet's notes and journals that are available on microfilm. That I know, it has not been published as such and is one of the first semi-quantitative descriptions of prairies in Minnesota. Nicollet was a French scientist hired by the U.S. Government to produce a map of the area between the Mississippi and Missouri Rivers. He did this with great precision, but his writings also display a real love for the people that lived in the area he surveyed. (He recorded the Native American names for many lakes and rivers and other geographic features). His life and explorations are detailed by E.C. and M.C. Bray, whose many works about Nicollet have been my introduction to this amazing man.

I have made some spelling and grammatical corrections to help the manuscript read more smoothly but have left it largely in its original form. It was a work in progress, and Nicollet never would have published it in its current form. Common names and current Latin names are provided in square brackets. Nicollet's names for plants are based in large part on the work of his botanist, Charles Geyer. In interpreting the names in Nicollet's manuscript, I have relied heavily on Michael Heinz's unpublished (1973, courtesy of U of MN Herbarium) work on Geyer's Journal and MacMillan's (1892) "The Higher Seed Plants of the Minnesota Valley, Botanical Series I".

Please notify me (ceumb@stolaf.edu) if you find this manuscript of use and/or you have questions. Work on this manuscript was made possible by a sabbatical leave provided by St. Olaf College. Any persons wishing to publish this transcription must seek the permission of the author.

-Charles Umbanhowar, Jr., Dept of Biology, St. Olaf College

Rise and Fall of the Vegetation by Joseph H. Nicollet

Spring in the woods

The first green which spreads over the woods and prairies are not so picturesque and visible as the remains of the different foliage in the fall or autumn, nor does the rapid progress of the vegetation in the spring leave us time enough to watch its variations in the different changes of color which it undergoes. Still we find the beautiful contrast of the young foliage of the Birch, White Oak, Red Oak, the

(continued on page 7)

SEED DORMANCY

by Gary Perrault

Wondering why seeds germinate, or don't? A viable seed goes from a dormant, quiescent state to one of active growth allowing the embryo to break thru its seed coat in the process of germination. This happens if, and when, internal chemical and physical conditions occur and necessary environmental requirements are met. Among the multiple factors causing dormancy or allowing germination are:

1-Internal chemical inhibitors which may need to degrade or need to be leached out;

2-Hard impermeable seed coats disallowing imbibition of H₂O;

3-Hydrophobic hairs or tissue covering seed;

4-High or low temperatures needed to alter chemical structures;

5-Immature embryos needing an "after-ripening" period for internal chemical changes;

6-Light or darkness requirements involving light intensity levels or wavelengths, particularly in the red and far red wavelengths which influence the chemistry of phytochrome molecules;

7-Oxygen content reaching the embryo. Many aquatic and wetland plants germinate under water where O₂ levels are low and may not germinate when exposed to air. Cattails and wild rice are examples.

Other methods are a hot water seed soak, boiling water dip, or room temperature H₂O soak for 24 - 48 hours, and various dips in acids. With these concepts in mind I conducted a test using seeds I collected from *Hibiscus moscheutos* (native to Eastern U.S.) which I grow in my gardens. Diameter is approx. 1/8"; that's intermediate between the size of *Lupinus* and *Baptisia*.

Treatment 1 -- soak seed in distilled water 48 hours.

Treatment 2 -- place seed in a cup of hot water (not boiling), soak until cool, 1 hour.

Treatment 3 -- place seed in a cup of water in microwave oven. Heat for 1 minute at High setting (does not boil). Soak until cool, one hour. Microwave ovens emit electromagnetic radiation in the radio wave spectrum. The microwaves excite H₂O molecules, which are bi-polar, causing them to vibrate. This generates heat, increases vapor pressure, and causes the volume of H₂O to expand both as a liquid and as a gas. It happens in free water in and around tissues as well as in any intercellular and intracellular water. Seeds were planted in trays, and trays were placed on a warm surface supplying bottom heat.

Results. -- All three treatments had equal success. 70% of seeds planted in media in each treatment germinated. Therefore, all three methods worked equally well to get moisture through the seed coats, and none killed the embryos. Survival of germinated seeds was also equal in the trays growing to transplant size. Seedlings were transplanted to individual containers, grown for the summer, and given away. Now, a few of my neighbors and landscape clients, schools, and even a friend I had not seen in 20 years have *Hibiscus* added to their landscapes.

No Photo Club Slide Show at Meeting

The Minnesota Botany slide show will not be presented at a NPS meeting this year because of a scheduling conflict. It can be seen at 7 p.m. Feb. 17 at the Refuge. Contact Jim Duncan, 651-459-3558.

The Minnesota Native Plant Society

Minnesota Plant Press

Gerry Drewry, editor

24090 Northfield Blvd., Hampton, MN 55031;

651-460-6755 (W), 651-463-8006 (H, fax)

E-mail: gdrewry@pioneerplanet.infi.net

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Vice-President: Bill Capman, Department of Biology, Augsburg College, 2211 Riverside Ave., Minneapolis, MN 55454; 612-330-1072; capman@augsborg.edu

Treasurer: David Johnson, 6437 Baker Ave. N.E., Fridley, MN 55432-5163; 612-571-6278; davjoh@maroon.tc.umn.edu

Secretary: Jackie Buffalow, P.O. Box 662, Mendota, MN 55150-0662; 651-423-2011; secretary-mnps@state.net

Deb Anderson, R.R. 1, Box 152, Chatfield, MN 55923; 507-867-4692 (H); gary-deb@worldnet.att.net

John Buffalow (see address for Jackie); johnbuff@state.net

Virginia Card, 3005 E. 25th St., Mpls., MN 55406; 612-696-6425; cardx004@tc.umn.edu

Dave Crawford, 4051 Gisella Blvd., White Bear Lake, MN 55110; 651-653-4385 (H); 612-583-2925 (W); birch7@main.goldengate.net

Gerry Drewry (see address above)

Joel Dunnette, 4526 Co. Rd. 3 S.W., Byron, MN 55920; 507-365-8091 jdunnette@mayo.edu

Catherine Reed, University of Minnesota Department of Entomology, 219 Hodson Hall, St. Paul, MN 55108; 612-624-3636; reedx012@maroon.tc.umn.edu

Andy Sudbrock, 4316 45th Ave. S., Minneapolis, MN 55406; 612-722-9467; ecology@mail.minn.net

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Minnesota Program for Certifying Native Seed

By Beth Nixon

(Abstract of Nov. 5 program)

The Minnesota Crop Improvement Association (MCIA) is a nonprofit organization certifying crop seeds in Minnesota. The stated purpose of certification is to preserve genetic purity and identity. Applicants to the Program are voluntary. MCIA certifies a broad range of the major agricultural crops and applies the same requirements to native species as agricultural crops.

The end of 1998 was the deadline for entering existing production fields of native seed into the certification process. An interest in what the growers have to say about certification prompted me to conduct a survey. The survey taken in 1998 on the eve of the deadline indicated a wide range of interest in certification. Here are the two major conclusions: Seed producer interest in the program is driven by the demands of wholesale customers. Retail customers are not expected to ask for certified seed or know the basis for certification.

Certification centers around the requirements for labeling bagged seed as "yellow-tag," source-identified. Yellow-tag indicates seed from natural stands or production fields; no breeding of the original (parent) material (population) has been conducted. The source refers to the genetic origin of the seed being inspected for certification. Certification does not place parameters on the source. The applicant defines the source, for example, a geographic region spanning several counties or one locality within one county. Several requirements must be adhered to for production fields, a number of which pertain to process and documentation. The two of interest from a genetic basis are isolation and land use. Isolation refers to the spacing between fields of plants from different genetic origin. The

isolation distance for grasses is 165 feet and forbs is 1320 feet. There is a 10% contaminant threshold. For self-pollinating species no distance is specified. Land use refers to the temporal 'isolation' requirements when two or more 'crops' (same species different seed source) are planted in rotation on the same field. The minimum rotation time period is three years. This means that three years must pass before a different seed source of the same species can be planted on the same field.

What does certification do to conserve Minnesota native plants? Certification is a means of providing information to customers. Certification is akin to labeling processed food. As such, certification itself does nothing to conserve native plants. It is a tool for informed consumers. The applicant can obtain yellow-tag status for non-bred seed from any origin. It is then up to the customer to decide if the seed source identified on the label meets their needs.

Much discussion among restorationists centers around the use of local populations. Much recent literature indicates that matching the abiotic factors at a planting site to those of a collection site is more important to successful propagation than geographic range alone. The choice of a seed source should also depend on the pollination strategies employed by the species being replanted. As restoration design becomes more refined, customers will begin indicating to growers and collectors of native seed more particular constraints on the source of seed. A vendor from Minnesota can theoretically carry a yellow-tag seed source identified to Iowa, Kansas, or Texas. The restorationist may then make an informed choice as a buyer.

There are a few concerns about the certification requirements with respect to population genetics of production fields. Cultural practices used on the fields can lead to genetic selection of seed type and

thus eliminate the range of genetic diversity in the field. For example, consistently harvesting seed at the same time, each season selects for seed of a certain maturity date. Other cultural practices can include soil conditioning, fertilizing, and watering. The producers will vary widely in the type and extent of cultural practices.

These concerns will be more significant if the market for native seed from production fields becomes predominant over collection. In the future a new level of certification may indeed be needed to address the cultural practices of production fields.

Expeditious Meetings

The board of directors has suggested the following methods to shorten monthly meetings.

1. Lights will be flashed and a bell rung at 6:55 p.m. so everyone can be in the auditorium at 7 p.m.
2. Announcements will be posted on an easel by the name-tag table, or given to Gary to read.
3. Committee reports should be to-the-point.
4. Plant-of-the-month and refuge speakers should limit their presentations to 10 minutes; the main speaker or panel will have 45 minutes.

Spring Field Trip

Char Bezanson is planning a spring wildflower field trip Sunday, April 18, at the Cannon River Wilderness Park in Rice County.

The group will meet at the Northfield Hardee's, at the junction of Hwy. 19 and Hwy. 3, at 11:30 a.m. The park is east of Hwy. 3 between Northfield and Faribault. RSVP to Char at 507-645-4496.

Thank You, Thor

Thor Kommedahl has retired from publishing this newsletter. We thank him for his fine work and his assistance during the transition.

Meet the Board

These bios were submitted by members of the Board of Directors of the Minnesota Native Plant Society.

Gary Perrault, President

Gary Perrault is a horticulture ecologist and landscape designer working with native and non-native plants. He develops projects with residential clients, schools, and community organizations and conducts research on plant growth cycles and behavior under differing environmental conditions.

Gary is a member of Ramsey/Washington County Natural Resources Board, a planning member of Vegetation Management Association of MN. He is the producer of three cable TV series: "Earth Care" Environmental Video Series, "30 Minutes With The Author," and "Media."

Bill Capman, Vice-President

Bill Capman, an Illinois native, moved to Minnesota about 4.5 years ago to take a job at Augsburg College, where he teaches ecology, genetics, marine biology, and general biology. His professional training is primarily in the areas of plant ecology (including research experience studying natural plant communities and in the revegetation of coal strip mines), insect ecology (plant-insect interactions in particular), and microbial ecology.

His interests in natural history and related areas are broad and varied, including a strong interest in native plants and the preservation of native plant communities, as well as interests in such areas as plant, insect, and bird photography, drawing and painting, fish breeding, and all aspects of gardening and horticulture. He has been a "compulsive gardener" for about as long as he can remember, growing everything from native plants, to fruits and vegetables, to tropical orchids. Currently there is very little lawn left in his frustratingly small Minneapolis yard!

David Johnson, Treasurer

David Johnson is a board member of the Orchid Society of Minnesota. He is also in charge of the Nature Area gardens at Woodcrest Elementary School. He has no formal training in natural sciences, but is interested in plants, animals and their habitats. He grows Minnesota native plants, orchids and carnivorous plants. He is interested in learning more about plant propagation and habitats.

Jackie Buffalow, Secretary

John Buffalow, Board Member

John and Jackie Buffalow are natives of Kansas City Missouri. A company transfer brought them to the Twin Cities from St Louis about 20 years ago. Although neither has a background in botany, biology, or ecology, they became interested in prairies, which led them to this organization.

Jackie and John both have careers in the computer industry. Some of their relatives are talented gardeners. John and Jackie are nurturing a crop of oak trees started from seed about four years ago. They are also growing many other native plants in their yard. MNPS has been a good place for furthering their knowledge and meeting others with similar interests.

Deb Anderson, Board Member

Deb Anderson grew up two miles west of the Minnesota Wildlife Refuge in Bloomington. She finished her B.S. in biology at the University of Minnesota in 1974. She entered graduate school in the Department of Botany and studied Paleobotany. She received a classic education but dropped out in 1977 when her health failed. She needed to work for money.

She married Gary in 1978, and they farm together near Chatfield in southeastern Minnesota. Their home and barn are historic stone buildings placed along Lost Creek. They grow corn, soybeans, alfalfa, oats and wheat. Most of the acres they farm are custom worked for other farmers. The Andersons' farm includes 80 acres of rolling pasture.

They have restored 20 acres toward prairie, using fire as their only management tool. In 1992, neighbors and The Chatfield Fish Game Club organized Prairie Smoke. This organization facilitates fire management, encourages the preservation of native prairies and uses local-source seeds for their projects at schools, parks and their homes. The demand for this group's time and equipment has increased each year.

Deb's current projects include a survey of Fillmore County roadsides for remnant native vegetation and a study of native planted roadside management. The information obtained should help county road workers manage and preserve native plants. She has been a member of the Board of Directors of MNPS since 1995. She helped with field trip planning last year and is the coordinator this year. Contact her if you want to lead a field trip.

Virginia Card, Board Member

Virginia Card is a plant ecologist teaching ecology and plant biology at Metropolitan State University in St. Paul. Last summer she surveyed plants in forest communities for the Anoka County Land Department in cooperation with the Minnesota State Department of Natural Resource County Biological Survey.

Virginia taught at Macalester College from 1993 to 1997 and Gustavus Adolphus College in 1998. She received her Ph.D. in Ecology from the University of Minnesota, where she worked with Herb Wright, Ed Cushing, and Joe Shapiro. Her research interests are in the dynamics of aquatic and terrestrial ecosystems, in particular the balance between predation, competition, and abiotic factors in determining the species composition of plant and algae communities.

Dave Crawford, Board Member

Dave Crawford's interest in plants began as a child with a vegetable garden and experiments

germinating and transplanting tree seedlings. By the end of his undergraduate years, he had acquired an interest and background in human uses of Minnesota plants, which led him into his career as a Minnesota State Park naturalist.

Dave now works at Wild River State Park, where he coordinates a prairie restoration seed collecting effort and offers programs on wildflowers, uses of plants, and landscaping using native plants (along with programs on wildlife, geology, and history). He and his wife offer annual tours of their home's native plant landscape.

Joel Dunnette, Board Member

Joel Dunnette has long had an interest in the outdoors. He spent two years at the University of Wisconsin at Madison, which is a leader in ecological restoration. It was there that his interest in prairie really took hold.

When the Dunnettes built a house in the country outside Rochester, they began to plant prairie around the house. Some of the seven acres planted to native prairie is now 12 years old, most is about 10 years old, and a bit still establishing itself. Joel has been involved in the enjoyment, interpretation, planting, preservation and management of local prairies. Most of his trips to local prairies have been through the Zumbro Valley Audubon Society, which he helped to establish and has helped run for the last 20 years.

At Joel's suggestion, Olmsted County Parks did a modest native prairie planting and got started in managing the existing prairie areas at Chester Woods Park. Joel has advised numerous individuals on their plantings and helped establish butterfly gardens at Whitewater State Park and at the Byron Elementary School. Through a grant from the state, they are establishing a prairie nursery for production of local-origin prairie plant seed, for use in local public and non-profit projects. His next project is to get good management started at several small prairie remnants around Rochester's flood-

control reservoirs.

When he retires from his desk job at Mayo in five years, Joel hopes to be able to spend most of his time on prairie and native plant projects, as well as birds and butterflies.

Catherine Reed, Board Member

This is Catherine Reed's second year on the board. She is an entomologist at the University of Minnesota and conducts research on pollination of native plants and insect conservation. She is also an artist and makes fabric wall hangings, usually with natural-world themes. Catherine is a native Minnesotan and learned the spring wildflowers at her mother's knee. As a board member, she tries to plan programs which will explore as many aspects of the world of native plants as possible.

Andy Sudbrock, Board Member

Andy Sudbrock is an ecologist specializing in the restoration, recreation and management of native plant communities in the upper Midwest. Andy is the CEO (chief ecological officer) of Applied Ecology, Inc., a Minneapolis-based company providing consulting, design, restoration and land management services to public and private clients mainly in the seven-county metro area and western Wisconsin. Andy's main interests include: his wonderful family, native plant conservation and restoration, canoeing, seed collecting, plant propagation, and being outdoors as much as possible.

Gerry Drewry, Editor

Gerry Drewry's interest in native plants began when she had about 25 acres of her Dakota County farm planted with native grasses, as part of the first Conservation Reserve Program. Later she had another 2.5 acres converted into a restored prairie. Her 12-acre wet meadow, or "hanging bog," is listed as a natural area. She has also been planting native flowers in a small woods. She joined the MNPS to learn more about her plants and is a past board member. Her career has been with newspapers and public relations.

Plant Lore

by Thor Kommedahl

What is skunk cabbage?

Skunk cabbage is *Symplocarpus foetidus*, in the Arum family, and the only species of this genus in North America. It is also called bear's-root, and polecat weed.

Is it native to Minnesota?

Yes, it grows in wet woodlands of the easternmost counties and in eastern United States.

How does it grow?

The marble-sized seeds sprout in spring, and produce a cluster of leaves that die back in fall; however, a new leaf bud forms under them in late summer. It may be seven years old before the plant produces flowers; these bloom in spring before leaves emerge.

When can plants first be seen?

In late winter, look in wet, swampy areas for purplish flower covers (spathes) that enclose flower buds. As flower buds enlarge, they produce enough heat to melt snow around them, once the temperature is above freezing. It will maintain a temperature of 70° F.

What is the function of heat?

One explanation is that by melting the snow, the plant speeds up its development and releases volatile chemicals to attract early pollinators by its strong, skunk-like odor. This odor is produced by all parts of the plant.

Are the roots different also?

Roots can be seen at edges of small streams and look like earthworms attached to a basal stem. These roots contract a little bit each year and pull the plants into the soil.

Obviously, this is a perennial.

Yes, some say it can live for a thousand years, but there are no data on this.

Are plants edible?

The roots are toxic and leaves produce a burning sensation when eaten. Pheasants and grouse sometimes eat the seeds.

Plant-of-the-Month Cooper's Milkvetch

By Nancy Sather

Cooper's milkvetch (*Astragalus neglectus*) (T. & G. Sheldon) is one of 11 *Astragalus* species native to Minnesota. It is likely that this species has been under-documented in historical collections because of its superficial resemblance to Canada milkvetch (*Astragalus canadensis*), with which it often occurs in Minnesota. Both species are erect members of the genus, with an almost shrub-like appearance, and both have creamy-white flowers in July.

Technically, they can be distinguished at this stage by the free stipules and plain hairs on the undersurface of Cooper's milkvetch leaves and the attached stipules and pick-shaped hairs on the undersurface of Canada milkvetch leaves. In practice, they intermix in patches and unless a botanist is persistent in looking at the stipules and hairs of every plant in a patch, Cooper's milkvetch easily could be overlooked.

During the fruiting season, from early August on, the two species are easily distinguished. Cooper's milkvetch has open racemes of inflated ovoid pods with a single chamber. These rapidly change through the month of August from green to mottled purple, then to chocolate brown. The dark pods persist on the plant throughout the fall and winter, even after the leaves have dropped. Canada milkvetch has a narrower inflorescence with a crowded head of elongate, two-chambered pods, ripening at about the same time, and also persisting late.

How rare is Cooper's milkvetch?

Cooper's milkvetch is a widely distributed but poorly documented legume of the northeastern United States and adjacent Canada. As recently as 1988 this species was believed to be so rare throughout its range that it was proposed to the US Fish and Wildlife Service for potential placement on the federal

endangered species list. Using herbarium specimens as their source of information, Bowles and Betz in a 1988 report cited only 92 historically documented stations for the species, 17 of them in Minnesota. Only 12 of these populations rangewide were known to be extant, and only two of them in Minnesota. It was downlisted from special concern to non-listed in Minnesota's last revision of the state's endangered species list because surveys subsequent to 1988 have documented an additional 166 populations in the state.

Range and habitat

Barneby (1964) reports the historic range of Cooper's milkvetch as extracted from herbarium labels as "local but widely dispersed about the Great Lakes." Early Minnesota collections suggested that in Minnesota the species was a denizen of lakeshores. More recent collections indicate otherwise. The species is now documented from 12 northwestern Minnesota counties. 127 of 181 known Minnesota populations occur in rights-of-way, only 15 in open woodlands and nine each on lake shores, in old fields, and in prairies. Six populations are known from areas designated as brush prairie and four are on recently disturbed soil.

Those populations in prairie generally occur in areas where woody invasion is occurring, or where it is being set back by prescribed fire, leaving a zone with lower cover of prairie grasses and a mix of shrubby and prairie species.

Recently-discovered populations in forested counties occur most frequently in openings characterized by higher light levels or more opportunity for soil disturbance than in the surrounding closed forests. The majority of such sites are in early successional microhabitats associated with oak and aspen forests, such as old logging trails, steep banks and public water accesses.

It is likely that Cooper's milkvetch was adapted to

disturbance caused by intermittent fires along the prairie forest border. The Minnesota Natural Heritage and Nongame Research Program is interested in receiving reports of populations in natural or semi-natural settings and in counties other than those in which the species has been documented. Sightings should be accompanied by a photo or a single head of pods and sent to Nancy Sather, DNR, Box 25, 500 Lafayette Road, St. Paul, MN 55155-4025.

Practical implications

Cooper's milkvetch presents an interesting challenge to plant conservation. It is one of a number of rare species that occurs most commonly in disturbed habitats. Not only are the majority of known populations in rights-of-way, those that occur in more natural habitats are usually in transitory zones, such as areas of prairie recently invaded by woody species, or the edges of woodlands being subjected to prescribed fire in a prairie matrix. The majority of Minnesota's right-of-way populations are along township or county roads maintained by periodic mowing, not by herbicide use.

In the case of Cooper's milkvetch, periodic mowing of roadsides may mimic successional setbacks formerly resulting from periodic fires, reducing competition, or potentially creating bare ground for germination. Creative protection of this species in Minnesota may hinge more on continuation of physical roadside management practices than on protection of natural habitat.

Such protection will require proactive coordination with all local units of government that manage rights-of-way in which Cooper's milkvetch occurs.

Volunteers Needed

The DNR is seeking volunteers to monitor dwarf trout lilies in late April and early May. Call Nancy Sather at 651-297-4963 for information.

Nicollet (Continued from page 1) flowering willows along the river banks mixed with early flowering undershrubs such as the Redbud [not clear what this is since out of range], the Dogwoods, and other every year again in a certain and almost the same beautiful contrast; but there is another more delicate contrast of strange and characteristic colors visible on the whole foliage of a Wood, which occur on most or every species of forest trees daily, up to the ultimate perfection and full size of its foliage.

So turns the White Oak from a ferruginous Red to a Silky Silvery green and up to the full size and richness of its foliage, it becomes soft and dark green, and its ash-colored branches and stem is sharply exhibited, this change continues up to the middle of June, then a certain uniformity prevails over the rich foliage of the woods.

Spring in the prairies

The prairies, however, undergo more different changes, in consequence of the different distributions of plants, in different situations and soils. There on the heights and broken surface of the country at the Mississippi the beauty of the vegetable Kingdom surpasses the imagination, considering it as a northern country and no less beautiful and interesting are the spring flowering plants of the woods and its borders.

Taking a walk from the apparent barren tops of the prairie near the bluffs and broken lands close by the river down to the Shady Woods at the river banks, our eye would be first fixed at the beautiful nuances of colors on the *Viola pedata* Lin. [Bird-Foot Violet] it appears like a blue sky spread over the grounds, embellished with the golden *Batshia hirsuta* [Hoary Puccoon; *Lithospermum canescens*], the purplish *Anemone Ludoviciana*? [Pasque Flower; *Pulsatilla nuttalliana*] and *Geum rivale* [Prairie Smoke; *G. triflorum*] and the interesting *Euchroma grandiflora*? [Downy Painted Cup; *Castilleja sessiliflora*].

Leaving this as the highest point of the surrounding country we step on the back slopes towards the prairies, here again we met the *Viola palmata* [Bird-Foot Violet; *Viola pedatifida*] in abundance associated with the bronze-yellow abundant *Pedicularis canadensis* [Wood Betony] with the bright scarlet *Callisteja coccinea* [Scarlet Painted Cup; *Castilleja coccinea*], interrupted by the blue modest *Phlox divaricata* [Blue Phlox]. Along the Sandy side of the hill we met again the beautiful *Viola pedata*, but this time scattered through rich golden bushes of *Batshia gmelini*, [Hairy Puccoon; *Lithospermum carolinense*] bordered with *Polygala Seneca* [Seneca Snakeroot; *P. senega*], which last is covered with its clear white spikes.

Going on down to the wooded and high banks of the river on rocky situations we met with the elegant *Aralia nudicaulis* [Wild Sarsaparilla] with *Smilax peduncularis* [Greenbriar; *S. herbacea*] stretching their deep green foliage through the broken rocks hid by the *Ribes 3 florum* [Missouri Gooseberry?; *R. missouriense*] and *Cynosbati* [Prickly Gooseberry; *R. cynosbati*], and *Ribes floridum* [Wild Black Current; *R. americanum*] in full foliage and blossom, hardly visible on the naked rocks and *Smilacina bifolia* [Wild Lily of the Valley; *Maianthemum canadense*] shows its beautiful pair of leaves.

So we leave the Rocky place and follow the banks of the woods, throwing before a glance on the everywhere abundant *Aquilegia canadense* [Wild Columbine] with its brilliant parrot-colored pendulous flowers. *Viola canadensis* [Canada Violet] in dense clubs with its stem considerable elevated seems to look around for her more humble relation on the same place, the *Viola cucullata*. *Hepatica acutiloba* [Liverleaf], with its tinged leaves and blue flowers occupies large space of the beautiful carpet associated the evergreen and hardy

Pyrola rotundifolia [Round-Leaved Pyrola].

Here we step to a damp rocky and low shady spot and see the *Cypripedium parviflorum* [Small Yellow Lady Slipper; *C. calceolus* var. *parviflorum*] from the prairies hid in the woods, among the glossy green young leaves of *Adiantum capillus* [Maidenhair Fern; *Adiantum pedatum*] and the beautiful blossoms of *Trillium erectum* [either *T. flexipes* or *cernuum*] with its large flowers like Alabaster and Rubin melting in each other diffused richly through the woods with the light green and curious twisted *Uvularia perfoliata* [Bellwort; *U. sessilifolia*] so common on most all the banks of the western rivers with its most common companion the pale purple *Geranium maculatum* [Wild Geranium].

Here we stop looking at the beautiful young foliage of *Tilia americana*, at the flowering *Xanthoxylon fraxineum* [Prickly Ash; *X. americanum*] in blossom, at the brownish growing seeds loosely and richly suspended as *Negundo fraxinifol.* [Boxelder; *Acer negundo*] the flowering shrub *Cornus alba*, on the flowering hazel on ridges mixed also with the flowering *Rosa parviflora* Ehrh. [*R. arkansana* or *blanda*].

Here we also notice some dull green Cedar on the distant Sandstone formation, we go and visit it when we discover the verge of the declivity embroidered with *Artemisia frigida*? and with it the delicate *Arenaria lateriflora* [Sandwort] with *Thesium umbellatum* [Bastard Toadflax; *Thesium umbellata*]. The swamps in the Prairies are filled with flowering *Carices* and the elegant *Eriophorum vaginatum* [Cotton-Grass; *E. spissum*] waving in the Wind.

So has the most beautiful season arrived the beginning of June, where the colors of the plants are the brilliant composition.

(This article will be concluded in the next issue. The full text is available on the MNPS web site.)

Minnesota Native Plant Society
University of Minnesota
220 Biological Sciences Center
St. Paul, MN 55108

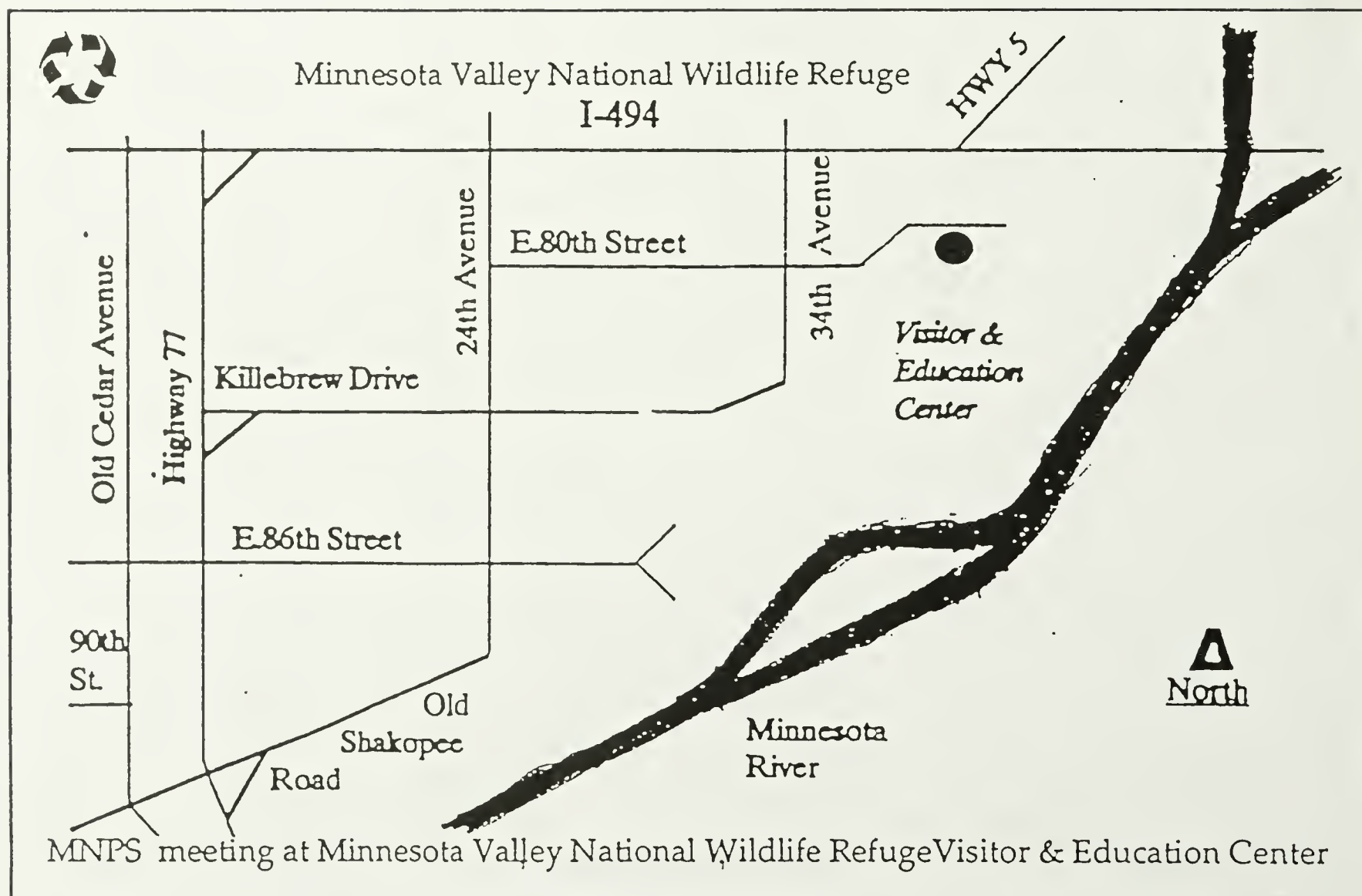
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Minnesota Plant Press

The Minnesota Native Plant Society
Newsletter

Volume 18, Number 3

Spring 1999

Upcoming Monthly Meetings

Minnesota Valley National Wildlife Refuge
Visitor Center, 3815 East 80th Street
Bloomington, MN 55425-1600
612-335-2323

6:30 - 7 p.m. — Refreshments, Room A
7 - 8:30 p.m. — Program, Society Business
8:30 p.m. — Socializing
9:30 p.m. — Doors locked at 9:30 p.m.

Programs

May 6

"Spring Peeper Meadow: a Sedge Meadow Restoration," Julia Bohnen, Minnesota Landscape Arboretum
Plant-of-the-Month:
White Cedar, by Meredith Cornett

June 3

Landscaping with Native Plants
Panel: Douglas Owens-Pike, Evergreen Energyscapes; Diane Hilscher, Hilscher Designs; Tom Tennant, Out Back Nursery
Plant sale

Oct. 7

Meetings resume after summer break.

How the plant sale works

The plant sale will follow the program. Members are urged to bring plants from their gardens by 6:30 p.m. Call Gerry Drewry, 651-460-6755, if you can help.

- Each plant must be in a container.
- Identify each plant, specify its habitat.
- Plant sale volunteer workers are first in line; people who brought plants are next, followed by everyone else.
- Price will reflect plant's rarity, size.

MNPS Web Site

<http://www.stolaf.edu/depts/biology/mnps>
Deadline for summer issue: July 1, 1999

How to sprout acorns

by Catherine Reed

Many fine neighborhood oaks, the last survivors of the presettlement plant community, have been lost to disease or wanton destruction. To relieve my sense of loss, I decided to sprout acorns and give away oak seedlings for neighbors to plant, and as always, the project got out of hand. Here's what I did, and what I've learned about acorns from last fall's observations, from reading and from other MNPS members.

Collecting acorns

I collected fallen acorns from bur oaks between July 22 and Aug. 15, from white oaks Aug. 22 - Sept. 20 and from red oaks Aug. 26 - Sept. 16. Perhaps the early warm spring and summer made acorns mature earlier than usual. Pin oaks planted by the city produced few or no acorns in 1998 in St. Anthony Park, St. Paul. It seems that a few immature acorns in their caps fall early or are knocked down by birds and squirrels, while the main acorn fall from a single tree is concentrated over just a few days. Acorns on the ground (or more conveniently on the sidewalk) are quickly removed by gray squirrels in our neighborhood. I collected only healthy mature acorns: these are dark brown or black, the caps have slipped off, and they have no holes. There is an amazing amount of variation in acorn size among oaks of the same species growing in the same neighborhood.

Acorn crops

For acorn production, weather must be mild when oaks are flowering. Trees also seem to have an internal cycle of acorn production, but I couldn't find out whether this is unique to each tree or whether trees of the same species may be synchronized over large or small areas. References state that northern red oaks produce good seed crops every two to five years, bur oaks every two to three years, and white oaks only every four to 10 years, beginning at ages 25, 35 and 20 years respectively. Acorn production begins to drop after age 150 for the bur oak and age 200 for the white.

Selecting and storing acorns

I subjected acorns to the float test by soaking them for 24 hours and rejecting any that floated. The floaters are expected to have a lower germination rate since many of them are damaged by weevils. Stored acorns need moisture and gas exchange, and references recommended storing the soaked acorns in plastic bags in the refrigerator. Some acorn weevils emerged into the bags, but I was unable to rear them to adulthood. The white oak acorns produced roots immediately, the bur oak acorns are starting to sprout now (Jan. 4), and the red oak acorns have shown no roots so far (they are reported to need 60-120 days of cold treatment before sprouting).

Continued on page 7

FRAGRANT PLANTS, PROPAGATION TEST

by Gary Perrault, President, MNPS

Item 1 - Among the native and non-native plant data I'm accumulating are phenological, cultural, and plant characteristic lists. One of these lists is "attractive plant fragrances" for woody and herbaceous plants. So far, on the native blossom fragrance list are: *Prunus* spp (cherries and plums), *Amelanchier* spp (juneberry, shadbush, or serviceberry), *Tilia americana* (American basswood or linden), *Asclepias syriaca* (common milkweed), and *Eupatorium perfoliatum* (boneset). For fragrant leaves: *Agastache foeniculum* (anise, fragrant, giant, or lavender hyssop), *Pinus strobus* (eastern white pine), and *Pinus* spp (pines), *Abies* spp (firs), *Picea* spp (spruce).

If you have any favorite fragrance plants according to your own subjective standards, please contact me so I can evaluate them. e-care@usa.net is the best way. Genetic variation will alter the strength and character of fragrance within any species. I didn't realize boneset was fragrant until I transplanted one that had grown only 14" tall in its original location in pure sand to an organic loam soil in my research garden. This boneset grew to 50" in my garden, and walking by in mid-summer, I noticed the attractive scent.

Item 2 - In a propagation test on *Ratibida pinnata* (yellow coneflower) I used stem cuttings made in mid-summer. I filled 10 pots with sandy loam and inserted four to five cuttings in each pot. Each cutting was 6" - 8" long and contained two nodes. All leaves were removed from the lower nodes and the cuttings inserted 2" into the soil. The pots were placed in afternoon shade and hand watered intermittently until September. Approximately 35 cuttings developed roots. Plants were then given to schools and friends.

No special care was given to these plants during the test, no rooting hormone was used, and occasionally they dried out for several days. It was surprising that most cuttings rooted anyway. Recognize that various hormonal and chemical changes must occur within the tissues to form roots from the cells at the nodes. In their normal environment, exposed to direct sun and dry summer air, these tissues do not form roots and senesce and die before winter.

Item 3 - In the past month I set up MNPS and Earth Care ecological displays at the Beautiful Landscape Fairs held at the Minnesota Valley Wildlife Refuge in Bloomington, and the Harriet Alexander Nature Center in Roseville. We had approximately 350 visitors come to the refuge and 850 at the nature center. Most exhibitors and speakers had a focus or involvement with native plants. Visitors were mostly "general public" with interests in habitat, native plants and their uses in landscaping.

New plan for treats

To keep those treats coming for the social time, the board of directors is suggesting a new system. Everyone who comes is invited to bring treats to one of the nine monthly meetings. When your name comes up bring two dozen cookies, a bottle of juice or whatever sounds good. We'll place a reminder on the postcard and in the newsletter. Here's the schedule, based on the first letter of your last name:

J or K, May meeting
L or M, June meeting

N, O, P or Q, October meeting
R or S, November meeting

T, U, V, W, X, Y or Z,
December meeting
A, B or C, February meeting
D, E or F, March meeting
G, H, I, April meeting

The Minnesota Native Plant Society

Minnesota Plant Press

Gerry Drewry, editor
24090 Northfield Blvd., Hampton, MN 55031;
651-460-6755 (W), 651-463-8006 (H, fax)
E-mail: gdrewry@pioneerplanet.infi.net

The Minnesota Native Plant Society is a tax-exempt 501 (c)(3) organization as determined by the U.S. Internal Revenue Service. Contact the society by e-mail at: mnps@altavista.net. Dues for regular members are \$12 per year; for students and seniors, \$10; for family, \$14; for institutions, \$20; and for donors, \$25. All dues include a newsletter subscription. Four issues are published each year. Make checks out to: Minnesota Native Plant Society; mail them to: Minnesota Native Plant Society, 220 Biological Sciences Center, 1445 Gortner Ave., St. Paul, MN 55108.

MNPS Board of Directors

President: Gary Perrault, 2229 Margaret St. N., North St. Paul, MN 55109; 651-773-9207; e-care@usa.net

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Deb Anderson, R.R. 1, Box 152, Chatfield, MN 55923; 507-867-4692 (H); gary-deb@worldnet.att.net

John Buffalow (see address for Jackie); johnbuff@state.net

Virginia Card, 3505 E. 25th St., Mpls., MN 55406; 612-696-6425; cardx004@tc.umn.edu

Dave Crawford, 4051 Gisella Blvd., White Bear Lake, MN 55110; 651-653-4385 (H); 612-583-2925 (W); birch7@main.goldengate.net

Gerry Drewry (see address above)

Joel Dunnette, 4526 Co. Rd. 3 S.W., Byron, MN 55920; 507-365-8091 jdunnette@mayo.edu

Catherine Reed, University of Minnesota Department of Entomology, 219 Hodson Hall, St. Paul, MN 55108; 612-624-3636; reedx012@maroon.tc.umn.edu

Andy Sudbrock, 4316 45th Ave. S., Minneapolis, MN 55406; 612-722-9467; ecology@mail.minn.net

Join us on a MNPS field trip

by Deb Anderson

Ada Hayden Prairie Preserve Sunday, May 30, 1 p.m..

Meet at the Spring Valley, Minn., Dairy Queen (Junction Hwy. 16 and Hwy. 63), and drive to see 240 acres of mesic to wet prairie in Howard County, Iowa. Only 10 miles from the Iowa-Minnesota border, this is Iowa's largest black soil prairie community. Just a few of the rare jewels that could be blooming include shooting star, prairie smoke, cream wild indigo, and wild quinine. RSVP to Sue Gossman, leader, at 507-867-3129; or to Deb Anderson, 507-867-4692, or e-mail Deb at: gary-deb@worldnet.att.net.

Prairie Moon Nursery Saturday, June 5, 1 p.m.; Saturday, Aug. 21, 1 p.m.

Visit Prairie Moon production facilities, gardens and restorations. From Winona: Hwy. 43 South, 1/4 mile to Winona Co. 17; 7 miles south to Witoka; continue south on 17 3.6 miles. From Rochester: I-90 east to Hwy. 43 north exit. Go south, left, on Winona Co. 19, 5.8 mi. Turn east, left, onto gravel Co. 17, go 1.5 mi. Prairie Moon nursery is in the north side of road.

Chester Woods Park Saturday, June 19, 9 a.m.

This Olmsted County park of over 1,300 acres contains Maple-basswood and mature oak woodlands, oak savanna, a stream, a lake, floodplain forest, old fields, bluff prairie, sand prairie, and mesic to wet-mesic prairie. We will visit several prairie areas that are a few years into active management and the parks nursery for local origin native prairie seed, which will produce its first picking this year.

As we see this interesting park, we will discuss management and we may identify some butterflies. This tour will include 2+ miles through varied terrain. Overnight camping, picnicking, fishing, and swimming are available on site. There is a modest park entry fee. Wear good footwear and bring water and a

picnic lunch if you like. Afternoon hikes into more secluded areas are possible.

Chester Woods Park is 7 miles east of Rochester on U.S. 14. Meet at 9 a.m. at the parking lot by the boat landing, which is just past the park contact station. Contact Joel Dunnette at 507-365-8091, or dunnette.joel@mayo.edu.

Other trips are possible to Nerstrand/Big Woods and Iron Horse Prairie SNA, with notice later. Contact Deb Anderson for the latest details or any field trip ideas. Phone 507-867-4692 or send e-mail to: gary-deb@worldnet.att.net.

Audubon Wildlife Garden Tour Saturday, July 31, 10 a.m.-4 p.m. by Mary Brown

This self-guided tour of five gardens in Burnsville, Eagan and Apple Valley will demonstrate how to attract birds, butterflies and other wildlife to suburban yards, using native wildflowers, grasses, shrubs and trees.

Tickets are \$10 on the day of the tour, purchased at Terrace Oaks Park, Burnsville Pkwy. and Co. Rd 11, or \$8 in advance. Mail your check by July 21 to Kathy Eich, 13709 Nicollet Ave. #301, Burnsville, MN 55337.

The tour is sponsored by Minnesota River Valley Audubon Chapter. Proceeds will fund an addition to Terrace Oaks Park, a rolling oak woodland, in Burnsville. For additional information, contact Mary Brown at 612-885-0913.

Swede Hollow Park, St. Paul. Thursday April 29, 3 pm.

by Virginia Card

Join students of the Metropolitan State University ecology class for a tour of this unique little park. Very steep hill-climbing or easy walking on a wheelchair-accessible paved path. Take the I-94 Mounds Blvd. exit; turn left onto E. 7th St., turn left into the Phalen Creek bicycle path parking lot on 7th St. The 7th St. bridge is over Swede Hollow.

Plant Lore

by Thor Kommedahl

What is American spikenard?

American spikenard is *Aralia racemosa*, a perennial of rich woods growing up to 6 feet tall. It has large spreading, compound leaves with 6 to 21, heart-shaped leaflets. It is in the *Araliaceae* (the ginseng family).

What are some of its relatives?

This species is in the same family as English ivy, ginseng, schefflera, and wild sarsaparilla. It is closely related to members of the carrot family and shares characters such as an umbel.

Is it a sarsaparilla?

It has properties similar to wild sarsaparilla (*A. nudicaulis*) but differs in having more aromatic roots and paniced umbels.

Is this family widely dispersed?

Yes, there are 55 to 70 genera and 700 species in this family, and they are distributed worldwide, with more species in subtropical and tropical areas than in the temperate regions.

What are some other distinguishing features?

The stems are smooth, dark green, reddish, even blackish. The flowers are whitish in small umbels on branching racemes. The fruit is a dark purple berry and the roots are spicy-aromatic.

Is this species useful economically or medicinally?

The berries have been used for making jelly, and the root was used to flavor root beer.

Are there medical applications?

Native Americans have been reported to use roots and stems for certain ailments, and, for a while, the species was listed in the National Formulary — a compendium of medicines and pharmaceutical preparations dispensed by pharmacists but not included in the United States Pharmacopeia. Now it is almost never prescribed; its therapeutic value is questionable despite reports of medical uses.

Local origin seed project underway near Rochester

by Joel Dunnette

A few years ago, at the instigation of some friends, I signed our Zumbro Valley Audubon Society up as primary sponsor for a project to develop a nursery planting for "local origin" prairie plant seed. Prairie study, planting, and management have long been an interest of mine. We wrote up the proposal, got several other groups to sign on, and somewhat to our surprise a few months later we were awarded a MN DNR Conservation Partners grant!

This is a matching grant program, DNR matches with dollars the labor and resources that the local groups spend on the project. To match the \$4,500 from DNR, we would have to get a lot of donated labor!

Our primary goal was to develop a continuing supply of locally native prairie species seed for restoration projects. Secondary goals were to increase community awareness, support, and expertise for use of native prairie species in plantings, and to establish experience, equipment, and a plan for management of prairie areas in Olmsted County. After a couple years of work (over 1,200 hours!) by many volunteers from ZVAS and other groups, we have largely accomplished our main goals.

We worked with Olmsted County Parks extensively to choose a site for the nursery and to establish a management plan for their prairie areas. Prairie and savanna areas need occasional fire to maintain them, and our culture has suppressed fire for decades. The county parks folks have been great to work with. We purchased burn management equipment and loaned it to them with some advice, and they are doing great management of the prairie areas in Chester Woods and Oxbow County Parks. They now also are providing burn education to the public. It only took a bit of "push" from us to get them

started. We also make the burn equipment available to private landowners for management of their prairie areas.

Working with our DNR advisor, we identified prairie remnants near Rochester. We recruited volunteers to collect seed and worked with them and the county ag extension agent to raise seedlings in a hoop house we purchased. By the fall of the first year we had collected sufficient seed to plant a 3.5-acre area with a diverse mix of native grasses and flowers.

We had students in school classes help plant the seedlings the following spring. This fall, after three seasons of growth, we should be able to make our first harvest. In another year or two we should be able to provide seed to restore around 20 acres of prairie each year. Having the seed source in a level, accessible, contiguous area is essential for efficient seed harvest. We also have seed available to plant an acre with wet-mesic prairie species, and are still working to find a site suitable for such a nursery. So our job is not over.

We still have some issues to work out: how to best go about harvesting and planting, and how to allocate seed to the many possible projects. We have several options for collection and planting, each of which will require some additional labor or cost.

Prairie and savanna are part of our natural heritage here in Southeast Minnesota. They have largely been destroyed. But we are doing our bit to save some remnants and to increase the area in this beautiful and productive plant community. It has taken some effort, but has been very rewarding.

New board members

Three new members of the MNPS Board of Directors were elected at the April 8 meeting. They are Harriet Mason, Nancy Sather and Deborah Strohmeyer. They will succeed Deb Anderson, Dave Crawford and Gary Perrault, whose terms will end in June.

Treasurer's Report

Fiscal Year 1998	
Checking account	
Beginning balance	\$4,128.76
Income	
Memberships	\$2,505.00
Donations	192.00
Bank interest	93.82
Wildflower guides	258.43
Other	730.00
Total income	3,779.25

Disbursements	
Printing	\$1,898.69
Postage & UPS	920.46
Speakers & writers	350.00
Supplies	22.23
Refreshments	0.00
Paid services	0.00
Advertising	0.00
Phone calls	0.00
Symposium	245.35
Other	365.37
Total disbursements	3,802.10
Ending Balance	4,105.91
Certificate of deposit	
Purchased 4/20/98	
Term 19 months	1,000.00
Total current assets	\$5,105.91

Ecosystem-based efforts profiled on DNR website

by Jan Wolff

An exciting and informative collection of profiles of ecosystem-based efforts is featured on the Department of Natural Resources' website: "Real People, Real Places: Ecosystem-based Works-in-Progress Around Minnesota." You can access the site from the DNR Home Page (www.dnr.state.mn.us) by clicking on the title "Real People, Real Places" under the Communities heading in the left column.

The "Real People, Real Places" pages were developed to deepen our own understanding of ecosystem-based management and sustainability concepts, and to have an effective tool for involving and communicating with citizens. There are currently 11 projects posted, with three pending and several more in development.

Agriculture With Native Legumes

by Donald Wyse

(Abstract of March 4 program)

The loss of biodiversity through agriculture results in an artificial ecosystem that requires constant human input. Seed-bed preparation and mechanized planting replace natural methods of seed dispersal; chemical pesticides replace natural controls of weeds, insects, and pathogens; and genetic manipulation replaces natural processes of plant evolution and selection. Decomposition of plant material is altered since crop growth is harvested, and soil fertility is maintained with fertilizers rather than relying on nutrient recycling.

The instability of intensive agroecosystems usually starts with weed, disease and insect problems which are linked to the expansion of short rotations at the expense of long rotations and natural vegetation. Plant communities that are modified to meet the special needs of intensive agricultural systems are subject to heavy pest damage, and generally the more intensely such communities are modified, the more abundant and more serious the pests. The inherent self-regulation characteristics of natural communities are lost when humans modify such communities so the natural interactions no longer occur. Some of these problems could be reduced through the addition of biodiversity to agroecosystems.

In addition to producing plant and animal products, biodiversity also enhances environmental quality. In natural ecosystems, the vegetative cover of forest or grassland prevents soil erosion, replenishes ground water, and controls flooding by enhancing infiltration and reducing water runoff. In agricultural systems, biodiversity performs ecosystem services beyond production of food, fiber, fuel, and

income. These renewal processes and ecosystem services are largely biological; therefore their persistence depends upon maintenance of biological diversity. When these natural services are lost due to biological simplification, the economic and environmental cost can be quite significant. Economically in agriculture, the burdens include the need to supply crops with costly external inputs, since agroecosystems deprived of basic regulating functional components lack the capacity to sponsor their own soil fertility and pest regulation. Often the cost involves a reduction in the quality of life due to decreased soil, water, and food quality when soil erosion or nutrient contamination occurs.

With the loss of diversity in our current agroecosystem there is a greater reliance on technological fixes to both biological and environmental problems associated with these systems. There is growing concern that agricultural technology may not be developed fast enough to solve the rapidly developing pest problems associated with current agricultural systems. The Red River Valley crisis is a case where technological fixes were not developed fast enough to avoid a systems disaster. This situation may have been avoided if more crop diversity and genetic diversity was maintained in the system.

In southern and southwestern Minnesota, farm diversity has declined in recent decades and currently about 75 percent of the land area is in a simplified corn and soybean rotation. This system requires high inputs of agrichemicals, including fertilizer and pesticides. The latter are required by a dramatic proliferation of serious crop pests such as European corn borers, soybean cyst nematodes, whitemold, root rots and weeds.

Leakage of agrichemicals and soil into rivers and lakes throughout the region has seriously degraded extremely valuable water resources. Farmers are now being asked to

modify their cropping systems to reduce environmental impact. However, modification of the current system without adding biodiversity results in greater economic risk to farmers and puts rural communities at risk as well. Farmers need new cropping options to add biodiversity to their crop rotation if they are to meet the environmental and economic demands that are being placed on them.

Indigenous legumes were important components of the native Minnesota grassland and prairie ecosystems that once dominated Minnesota's landscape. These species present a unique opportunity to increase the diversity and profitability of modern agricultural systems by incorporating these native species into grazing systems. Native legumes are well-suited for grazing systems in the Midwest because they will even out the production of forage biomass across the growing season; increase the forage quality and yield of pastures; are adapted to floodplain environments; and have growth habits that complement warm-season grasses.

Researchers at the University of Minnesota plan to evaluate the establishment and persistence of two native perennial legumes; Illinois bundle flower (*Desmanthus illinoensis*) and false indigo (*Amorpha fruticosa*), in grazing systems. The research program is being conducted on-farm and at the University of Minnesota Research Stations at St. Paul and Morris. The program will emphasize improving perennial native legumes by selecting for forage yield, forage quality, seed yield, disease and insect resistance, persistence, and grazing tolerance.

For more information on the native legume program at the University of Minnesota, contact Dr. Donald Wyse at the Minnesota Institute for Sustainable Agriculture 1-800-909-MISA.

Dr. Wyse is Executive Director of the Minnesota Institute for Sustainable Agriculture.

Rise and Fall of the Vegetation

by Joseph H. Nicollet

Transcribed by Charles Umbanhowar, Jr.

(This is the second of two installments of a portion of Joseph Nicollet's description of Minnesota prairies. It is a transcription of the English translation of his notes and journals. The first portion was printed in the Winter 1999 issue of the Minnesota Plant Press. The full text is available on the MNPS website.)

Summer in the high prairies

The high prairies however unfold their beauty not before the beginning of July; it is strikingly different from the lower Situations. Its green is most thoroughly glaucous, and those most characteristic glaucous plants are very abundant, and give a great uniformity to its appearances, which is only a little interrupted by the dark green foliage of *Ceanothus americanus* [New Jersey Tea] and very few smaller plants of a dark green color.

Before reaching the glaucous heights are two plants abundantly distributed over the more fertile plains — it is the *Zizia cordata* [Golden Alexander; *Zizia aptera*] and *Helonias dioica* [Death Camas; *Zigadenus elegans*] — and the white fragrant clusters of *Galium Septentrionale* [Northern Bedstraw; *G. boreale*], associated with the beautiful azur blue *Tradescantia virginica* [Spiderwort; prob. *T. bracteata*] and the small *Hypoxis erecta* [Yellow Star-Grass; *H. hirsuta*]. At the rising heights we notice the *Amorpha nana* [Fragrant False Indigo] sparingly scattered and parading with its conspicuous purple violet spiked panicles not seldom among the most dense grasses.

Reaching the tops of the gravelly ridges *Amorpha canescens* [Leadplant] and *Psoralea (glauc?)* [Silver Scurf Pea; *P. argophylla*] give the glaucous green color to the

foliage filled with its Indigo blue flowers towards the middle of July. But before this time most of the beautiful *Astragalus* have laid down their ornaments as *Astr. adsurgens?* Hook., *Astr. caryocarpus* [Ground-Plum; *A. crassicaarpus*], *Astr. 172.* *Astr. 198.* So the abundant *Heuchera americana* [Alumroot; *H. richardsonii*], the *Batshia longiflora* [Narrow-leaved Puccoon; *Lithospermum incisum*], and many other plants not always on the place together but of the same association.

Stipa avenacea [Porcupine Grass; *S. spartea*] and *Hordeum jubatum* [Squirrel-Tail Grass] generally abundant together are already in ripening fruits before *Amorpha canescens* [Leadplant], *Rudbeckia purpur.* [Purple Coneflower; *Echinacea angustifolia*], *Coreopsis tripteris* [Tickseed; *C. palmata*], *Linum rigidum* [Flax] and the splendid *Oenothera canadensis* [Calylophus serrulata], *Potentilla bipinnatifida* [*P. pensylvanica*], *Acerates longifolia?* [Milkweed; perhaps *Asclepias hirtella*], *Penstemon pumilum* [may be one of several native species] *Aster albus* [Solidago ptarmicoides] and *Lilium Catesbaei* [Wood Lily; *L. philadelphicum*] complete the meagre carpet of those ridges, but give it such a striking brilliant color, which is the more seldom as it is besides that on the rough gravelly soil scattered over a slope covered with masses of large and small boulders of granite and others; appears sterile in the highest degree.

But everywhere displays nature its grandeur and the eye of the minute observer of the beauties of nature rests with higher admiration on such simple scenery, which is of so short a duration that the destructive frost sometimes even touches them before their proper time for their ripening their seed passes by.

Late summer on the prairies

The declination of the vegetation power is first visible on these height about the middle of August or a little before that time, when

Rudbeckia purpurea [Purple Coneflower; *Echinacea angustifolia*] has thrown off its purple ornament; here and there begins the *Gerardia purpurea* [*Gerardia*; *Agalinis aspera*] and *Solidago nemoralis?* [Grey Goldenrod] and *stricta?* [Rigid Goldenrod; *S. rigida*] but they are generally on some lower situations and the hilltops show only the widely spaced and common *Artemisia vulgaris* [probably not the introduced species of this name, may be White Sage; *A. ludoviciana*] and *canadensis* [*A. campestris*].

Lower down in the more level prairies the *Rudbeckia pinnata* [Grey Headed Coneflower] is in full bloom and the beautiful *Petalostemon violaceum* [Purple Prairie Clover; *P. purpureum*] and *candidum* [White Prairie Clover] are in perfection, associated with the (doubtful) *Helianthus strumosus?*, *Lechea major* [Rockrose; *Helianthemum bicknellii*] and *Liatris scaricosa* [*L. aspera*] and *ciliaris* [*L. punctata?*] sometimes occupying a wide plain or hill for themselves, always in high perfection, they form a very imposing effect. Scattered through the wide level prairies in great profusion are several grasses (the a,b,c,d of these alike situations in the collection) particularly 296 and 301. Particularly abundant everywhere is the 328 and 329.

In the low prairies and bottoms is a high luxuriance and beauty — *Silphium conatum* [Cup Plant; *S. perfoliatum*] with innumerable golden yellow flowers, bushes of *Monarda clynopodia* [Bergamot; *M. fistulosa*] covered with rose-colored flowers and the *Labiata* plants 318 [Fragrant Giant Hyssop; *Agastache foeniculum*] abundant in every bottoms along the foot of hills and borders of woods, its beautiful blue whorled spikes gives the completion and a grandeur of the prevailing golden yellow masses.

But the more the golden yellow colors reign and prevail over the prairies, the nearer is the time of their destruction by the frost; and a short time before it this color

prevails on every Situation above the beautiful genus *Aster*, which generally bear lilac and purple violet flowers. Except the white *Aster foliosus* [Heath Aster; *A. ericoides*] of the elevated prairies and *Aster Salignus* [Panicked Aster; *A. lanceolatus*] of the swamps add the only variation to this uniformity and the last of all the Flora gifts, the *Gentiana quinqueflora* [*Gentianella quinquefolia*], *G. Saponaria* [Bottle Gentian; *G. andrewsii*] from the lower situations, the *Gent. ochroleuca* [Yellowish Gentian; *G. alba*] and *fimbriata* [Fringed Gentian; *Gentianopsis crinita*] and *Pneumonanthe* [Closed Gentian; *G. rubricaulis*] which last two are the most beautiful flowers of the autumn, if not of the whole seasons.

Fall on the prairies

Soon the frost destroys most all the remaining beauty, on high or low, and scarcely any plant remains alive after the second week of September save the hardy flower of *Gentiana angustifolia* [Prairie Gentian; *G. puberulenta*] and *Aster Salignus* [Panicked Aster; *A. lanceolatus*] on the borders of Swamps embracing the still flowering golden *Utricularia vulgaris*; the borders of Swamps then are the only remaining vivid green.

The defoliation comes suddenly all over the country — the acorns of the overcup white oak fall rapidly, which remained until then, even fully grown in their cups and only a few days elapse and they are covered with leaves and the tree stands deprived of his awning ready for a stern northern winter. Not so the red oak, the leaves turn to that well known brown in which awning they remain not seldom through the whole of November — and this is the last of the many variations which vegetation in the open country undergoes before the defoliation by Snow and strong frost.

Fall in the woods

The lower woods along the bottoms of the Mississippi are so

much sheltered that the defoliation takes place much later. Often we see white maples in the fullest green besides a naked white oak or *Ulmus fulgida* [Red Elm; *Ulmus rubra*]. The last of all is the *Smilax rotundifolia* [Greenbriar; *S. hispida*] which remains green late in the winter covered with its bunches of black spheres of berries in a fine contrast with the scarlet or ornamental fruit of *Euonymus americanus* [Wahoo; *E. atropurpurea*].

Along the Sandstone escarpment on the sandy banks of the Mississippi the evergreen trees and shrubs produce a very picturesque effect. *Pinus Strobus* (the white pine) covers the Tableau of the rocky heights intermixed with the *Juniperus virginiana* [Eastern Red Cedar]. On the sandy table heights the *Pinus rigida* [Jack Pine?; *P. banksiana*] with *Juniperus communis var depressa* Pursh [Ground Juniper] *Arbutus uva ursi* [Bearberry; *Arctostaphylos uva-ursi*] and (457) is the only green remains. In soils with the white pine the *Chimaphila umbellata* [Pipsissewa] with its beautiful foliage mingled with the variegated silver veined *Goodyera pubescens* [Rattlesnake Plantain]. *Asplenium rhizophyllum* [Walking Fern; *Camptosorus r.*] neatly covers the naked cracks of the rocks with *Polypodium* [Common Polypoidy; *P. virginianum*] (458) and the *Vaccinium Corymbasum* [not clear what species this actually is] in blossom. This is the variety of the subalpine regions generally more composed of evergreen plants than others, flowers may be found to the latest part of November and the first beauties of Spring may be found on the same place, generally solitary and the most romantic dress of Nature.

The City of Plymouth and Gleason Lake Elementary School are hosting an environmental fair May 17 from 6:30 to 8:30 p.m.

Carrol Henderson's newest book, "Lakescaping for Wildlife and Water Quality," is now available.

Sprouting acorns

continued from page 1

Planting indoors.

I don't want to be surrounded by oak seedlings now, but as a test I planted some in pots and placed groups in an unheated shed, an attached garage, in the refrigerator at 4 degrees C (44 degrees F), and at room temperature on Nov. 11. The ones at room temperature sent up shoots immediately and made a charming arrangement in a basket with moss. The others have shown no stems and leaves (Jan. 4).

The future of acorns

When spring comes I'll plant the sprouted acorns in deep pots protected from squirrels. If mother nature smiles there will be plenty of seedlings for neighbors, schools, scouts, low-budget restoration projects, etc. By then I'll get a handout ready on planting oaks, unless someone has one already that they're willing to share. There are many interesting activities for classes involving acorns, oak trees, acorn weevils, squirrels, blue jays etc., which can conveniently be done at acorn fall when school has already started.

Join the fun.

To give or receive more information, or if you would like some sprouted acorns or seedlings, call me at 651-644-3765 or e-mail to reedx012@tc.umn.edu (that's reedx zero one two, as I'm known at work). It would be very interesting to compare observations of acorn crops around the state and metro area.

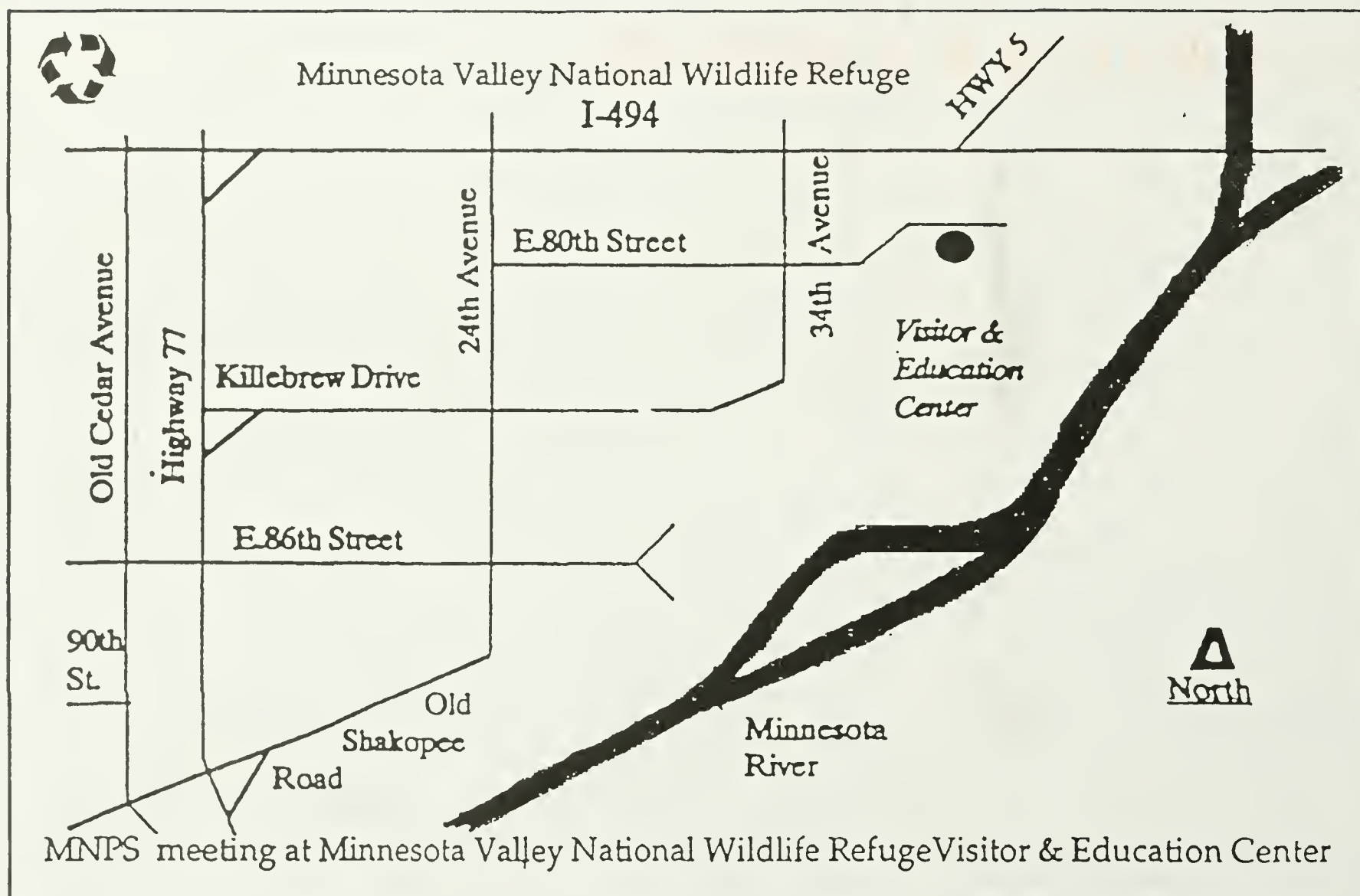
Monitor dwarf trout lilies

Nancy Sather needs volunteers to monitor and search for Minnesota dwarf trout lilies. Teams will monitor established plots at nature preserves, Riverbend Nature Center and Big Woods State Park. The dates will depend on flowering, but will probably be between April 20 and May 10. Volunteers will be scheduled in advance. E-mail Nancy at nps@wavetech.net or nancy.sather@dnr.state.mn.us. Or leave a message at 651-297-4963.

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NEW YORK
BOTANICAL GARDEN

Category	Item	Value
Agriculture	Wheat	1200
	Corn	800
	Soybeans	600
	Cattle	400
Manufacturing	Automotive	1500
	Electronics	900
	Chemicals	700
	Food Processing	500
Retail	Department Stores	1100
	Supermarkets	950
	Electronics Retailers	800
	Specialty Stores	650
Healthcare	Hospitals	1300
	Pharmaceuticals	1000
	Medical Equipment	850
	Health Insurance	750
Education	Universities	1150
	Public Schools	900
	Private Schools	750
	Research Institutes	600
Energy	Oil Refineries	1400
	Nuclear Power Plants	1200
	Solar Panel Factories	800
	Wind Turbine Manufacturers	650
Transportation	Airplane Manufacturers	1350
	Shipbuilding	1100
	Railroad Equipment	900
	Trucking Companies	700
Real Estate	Commercial Properties	1250
	Residential Developments	1050
	Construction Firms	950
	Real Estate Agencies	850
Finance	Investment Banks	1450
	Insurance Companies	1250
	Banking Institutions	1100
	Financial Services	950
Technology	Software Development	1300
	Hardware Manufacturers	1150
	Internet Service Providers	1000
	Mobile Device Manufacturers	900



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#4



Minnesota Plant Press

The Minnesota Native Plant Society
Newsletter

Volume 18, Number 4

Summer 1999

Upcoming Monthly Meetings

Minnesota Valley National Wildlife Refuge
Visitor Center, 3815 East 80th Street
Bloomington, MN 55425-1600
612-335-2323

6 - 6:30 p.m. — Board meeting, Room B
6:30 - 7 p.m. — Refreshments, information,
Room A
7 - 9 p.m. — Program, Society Business
9 - 9:30 p.m. — Socializing
9:30 p.m. — Doors locked

Programs

Oct. 7

"Seed Collecting for Prairie
Restoration," Dave Crawford.

Plant-of-the-Month: To be announced

Nov. 4

Speaker to be announced

Seed Exchange

Dec. 2

Speaker, plant-of-the-month

MNPS Web Site

<http://www.stolaf.edu/depts/biology/mnps>

Plant sale is a success

Treasurer Dave Johnson reports that the June 3 plant sale brought in \$593.35. The 1998 total was \$489.50; the 1997 total was \$283. Co-chairs Gerry Drewry and Dave Crawford thank all of the volunteers who helped that evening and all of the members who donated plants.

An invitation to writers

Members are invited to write articles for the Minnesota Plant Press. The next deadline is Sept. 1. Call Gerry Drewry at 651-460-6755 for information.

Volunteers aid Wild River Park restoration

Prairie Restoration, Environmental Education, and Public Involvement

by Dave Crawford

Wild River State Park is a nearly 7,000-acre unit of the Minnesota state park system located on the St. Croix River about 10 miles north of Taylors Falls. It contains a tremendous variety of native plant community types, some in near-pristine condition, others massively impacted by 150 years of farming, grazing, and wood-cutting.

The legislation which established the park in 1973 requires that the park be managed to preserve and restore the pre-European settlement landscape. Prairie management and restoration efforts are the largest and best illustration of progress towards this goal.

Most of the original prairie and savanna has been replaced by old field vegetation. The lack of fires in the landscape has also led to loss of prairie diversity and increasingly brush-choked, shady woods.

The first effort to improve the health of prairie communities was the institution of prescribed burning in old field habitat about 1983. Acreage burned was increased through the mid-80s, but the emphasis remained on using fire to suppress cool-season European grasses in old field habitat to allow a foothold for prairie remnants at field edges to expand.

Planting of native grass supplemented burning from the late '80s to 1991, with a total of 15-20 acres planted with little bluestem, big bluestem, and Indian grass. Service groups, such as Boy Scouts, had their first opportunities for involvement by hand-collecting seed from these plantings for use in expanding the planted areas.

In the early 1990s, prescribed burning efforts expanded to include control of woody plants and European grasses invading prime-quality prairie remnants. Burns were also carried into the edges of woods to reverse shade encroachment and to stimulate dormant seed of native prairie species to germinate. Service groups cut back brush to clear forest understories prior to burning.

A review of air photography from 1938 led to another project to clear woody vegetation from formerly open land. The photos showed oak savanna was present in what had later become a spruce plantation.

Continued on page 3

From the President

By Catherine Reed, President, MNPS

The spring wildflowers were spectacular and there is much more to come. Prairie flowers are approaching their peak and will be getting better and better through midsummer on into fall, with the restorations blooming a bit earlier than the native sites. It's also time to enjoy many insect species. Look closely at flowers to see pollinator, predators and their prey as their populations increase throughout the summer. Seed collection has already begun, and acorns will be falling by the end of July.

At the June retreat, the MNPS board discussed the society's multiple purposes. We have done well on education of our own members, and need to continue this. The society was also founded to conserve native plants, educate the public, encourage research on native plants, and preserve plants and their habitats, through our own efforts and by cooperation with other programs. We have not kept up with all these areas at all times, but they are well worth pursuing. Think about possibilities as you hike the woods or prairies, or pull alien weeds at home, and bring your ideas to the fall meeting or to this newsletter.

I am happy to be president of MNPS for the coming year. Let me know your thoughts.

Board elects new officers

The Minnesota Native Plant Society Board of Directors held its annual retreat Sunday, June 27, at Gerry Drewry's home. The agenda included election of officers, appointment of committee chairs and initial program planning for the 1999-2000 year.

Catherine Reed was elected president; Joel Dunnette, vice president; and Virginia Card, secretary. David Johnson was re-elected treasurer. Committee chairs are: Program, Virginia Card; Conservation, Val O'Malley and Nancy Sather; Membership, David Johnson and Diane Hilscher; Education and Outreach, Harriet Mason.

Dave Crawford will again be audio-visual coordinator; Joel Dunnette will be his back-up. Catherine Reed will be treats coordinator. We will continue to assign treat responsibility to all members according to their last names. This information is to be included on the meeting-reminder postcard.

Deb Anderson will again be field trip coordinator. Most trips were well attended, but a system for cancelling a trip if there is not a minimum number of reservations may be needed. Trips will be announced on the web page and listserv. Gerry Drewry is newsletter editor. Marcie O'Conner will continue to be responsible for the wildflower guide and Don Knutson for the brochure.

We need a historian/archivist, or at least a place where records are stored. Suggestions from members will be welcomed. Gerry Drewry and Dave Crawford will continue to coordinate the plant sale; Dave will continue to coordinate the seed exchange. We hope Ruth Phipps will continue to make name tags and staff the membership table.

General meetings will continue to be held at the Minnesota Valley Wildlife Refuge the first Thursday of the month. The

The Minnesota Native Plant Society

Minnesota Plant Press

Gerry Drewry, editor

24090 Northfield Blvd., Hampton, MN 55031;
651-460-6755 (W), 651-463-8006 (H, fax)
E-mail: gdrewry@pioneerplanet.infi.net

The Minnesota Native Plant Society is a tax-exempt 501 (c)(3) organization as determined by the U.S. Internal Revenue Service. Contact the society by e-mail at: mnps@altavista.net. Dues for regular members are \$12 per year; for students and seniors, \$8; for families, \$15; for institutions, \$20; and for donors, \$25. All dues include a newsletter subscription. Four issues are published each year. Make checks out to: Minnesota Native Plant Society; mail them to: Minnesota Native Plant Society, 220 Biological Sciences Center, 1445 Gortner Ave., St. Paul, MN 55108.

MNPS Board of Directors

President: Catherine Reed, University of Minnesota Department of Entomology, 219 Hodson Hall, 1980 Folwell Ave., St. Paul, MN 55108; 612-644-3765; reedx012@tc.umn.edu

Vice-President: Joel Dunnette, 4526 Co. Rd. 3 S.W., Byron, MN 55920; 507-284-3914 (W); 507-365-8091 (H); dunnette.joel@mayo.edu

Treasurer: David Johnson, 6437 Baker Ave. N.E., Fridley, MN 55432-5163; 612-571-6278; davjoh@maroon.tc.umn.edu

Secretary: Virginia Card, Metropolitan State University, 700 E. 7th St., St. Paul, MN 55106; 612-722-5022; cardx004@tc.umn.edu

Dave Crawford, 4051 Gisella Blvd., White Bear Lake, MN 55110; 612-583-2925 (W); 651-653-4385 (H); birch7@goldengate.net

Harriet Mason, 905 S. 5th St., St. Peter, MN 56082-1417; 507-931-3253; cmason@gac.edu

Nancy Sather, 612-721-4803; nps@wavetech.net

Roy Robison, 1833 Monroe St. NE, Minneapolis, MN 55418; 612-788-4621; landscapealt.earthlink.net

Deborah Strohmeier, 7900 Wyoming Ave. S., Bloomington, MN 55438; 612-943-9743; debstrohmeier@yahoo.com

Gerry Drewry, ex-officio (See address above.)

announcements prior to the program need to be briefer. A symposium is to be held no decisions were made on subject or date.

The next board meeting was tentatively set for 1 p.m. Saturday, Sept. 11, at the Minnesota Valley Wildlife Refuge.

Wild River Park

Continued from page 1

The spruces were clearcut, the area was burned, and native prairie plants germinated from seed that had survived under the carpet of spruce needles.

By 1998 over 50 native prairie and savanna species were in bloom on the site, without any seed being planted.

Through the mid and late 1990s, field work identified an increasing number of open and semi-wooded areas with surviving prairie forbs and grasses, and more ambitious prescribed burning was initiated to suppress encroachment on these areas and stimulate more growth of native species. This went hand-in-hand with a "new generation" of service projects which not only gave the park badly needed assistance, but gave people personal experience in helping restore rare or damaged communities.

New service projects include brush clearing and aspen girdling to open up former savanna sites to sunlight. Prairie and savanna species are increasingly visible at locations where this has been done, and resprouting of aspen and brush has been set back. Foremost among the new service projects is the ongoing effort to collect a diversified range of species of seed to expand prairie remnants into old fields opened by prescribed burns. Beginning in 1993, forb seed was collected in addition to grass seed.

Prospective collecting sites for each species are located and mapped. Species that are hard to relocate are flagged. Collectors from previous years are contacted and announcements of collecting opportunities are placed in local newspapers, DNR publications, the Plant Press, and the DNR website.

Each individual or family is given a seed stalk of the species they are to collect for identification purposes, and a map of the location where they will find the plant. Volunteer hours for seed collecting

and post-collection processing have increased steadily, with an estimated 500 hours this year yielding a collection of 101 species.

A spin-off of the collecting effort has been the participation of school groups in collecting and sowing seed. School classes visit the park for an introduction to the reasons behind restoration work, then spend up to an hour either collecting an assigned species in the fall or sowing a seed mix on a prepared site in spring. Some groups are coming for both, and also bring seedlings they started in the classroom for transplanting in the park. These repeat visits lead to a much greater understanding of and concern for native plant communities.

To extend the restoration effort, the park has worked with area Wildlife and Department of Transportation personnel to provide a site for machine-harvesting of grass seed for cooperative use, and is exploring ways to work with Carlos Avery Wildlife Management Area and with native plant producers for mutual benefit.

Because of the interest and hands-on participation in restoration efforts, Wild River State Park may see a reasonable facsimile of an extensive prairie ecosystem in 10 or 15 years instead of the many decades originally projected. We can expect to see increasing efforts to restore native plant communities or low-impact native landscaping across a broader area than the park could have reached by more conventional education efforts.

To get involved, write Dave Crawford, Park Naturalist, Wild River State Park, 39755 Park Trail, Center City, MN 55012; call (651) 583-2925; or send e-mail to: dave.crawford@dnr.state.mn.us

Help collect seeds for Wild River Park

Seed collection for restoration of Wild River State Park's Prairies will take place at 1 p.m. every Saturday and Sunday from Sept. 18 to Oct 31. Come as many times as you'd like. Your contribution of time will help increase native plant diversity on former farm land.

For more information, write Dave Crawford, Park Naturalist, Wild River State Park, 39755 Park Trail, Center City, MN 55012; call him at (651) 583-2925; or e-mail dave.crawford@dnr.state.mn.us

Plant poachers destroying prairies

Plant poachers are decimating prairies in Montana and North Dakota. Their primary target is the narrow-leaved purple coneflower (*Echinacea angustifolia*). The poachers sell the roots for use in popular herbal remedies for prices ranging from \$16 to \$50 per pound. The poachers face fines of up to \$10,000, but they are rarely caught.

Echinacea poaching has not been a problem in Minnesota, possibly because we do not have large fields of coneflowers. Commercial cultivation of *Echinacea* plants may help. Dan Svedarsky, wildlife biologist for the Northwest Experiment Station at the University of Minnesota at Crookston is working on propagation techniques.

As medicinal uses for native plants are discovered, more and more people are recognizing the value of the plants — either as assets to be maintained, or as resources to be plundered.

Sweet cicely leaves provide licorice flavoring

Licorice flavoring from *Osmorhiza Sweet cicely* (*Osmorhiza claytonii*) or anise-root (*O. longistylis*) are perennial herbs that produce licorice-flavored roots. Leaves from spring to fall are valued as flavorings for fruit, seafood, salads, soups and stews. Both species are native to Minnesota and grow throughout the state. (T. Coffey in Wildflowers, 1993).

Spring Peeper Meadow is model wetland restoration

By Julia Bohnen

(Abstract of May 6 program)

The idea for Spring Peeper Meadow (SPM) was conceived in 1995 when the Minnesota Landscape Arboretum (MLA) received funds from the Legislative Commission on Minnesota Resources (LCMR) and the MLA Foundation to purchase 30 acres of land adjoining its eastern boundary. The property had been slated for development by light industrial or commercial enterprises. This development would almost certainly have threatened the integrity of the watershed within which the MLA sits.

With the recent addition of a wetland ecologist to the horticulture department at the University of Minnesota and the topography of the land, it was natural for the MLA to consider the restoration of a wetland on the newly purchased land. Dr. Susan Galatowitsch will conduct research into the establishment of sedge meadow vegetation and its associated hydrologic, edaphic (soil), and faunal components. The wetland restoration can be utilized as a model for developers and other professionals involved in restoration efforts. The area also provides an opportunity for the MLA to interpret to its diverse audience the values, functions, and qualities of a wetland type which is threatened in Minnesota.

Evidence from soil cores taken in the basin and data from the original land survey indicate the area to be restored was historically a shallow wetland within the Big Woods. The restoration site had been farmed since the late 1800s. It was drained at first by ditches, and was first tile-drained in the 1920s. At the time the land was purchased, the uplands were cropped in a corn-soybean rotation, and the basin was covered in a monotypic stand of reed canary grass (*Phalaris arundinacea*).

Site preparation included vigorous efforts to rid the area of the mature stand of reed canary grass. The stand was treated with Round-Up® in August 1995. A burn in September removed the plant canopy. This effectively encouraged any new growth of rhizomes that were not dead and promoted germination of the seed bank. An additional application of Round-Up® in September and spot treatments in October and periodically throughout the following growing season effectively eliminated the mature population of reed canary grass and recruits from the seed bank.

The tile was broken in October 1996. Nonperforated tile was added to the ends of the tile lines and capped by in-line stoplogs to allow control of water levels for vegetation management purposes. The site was lightly tilled and dormant seeded in October and November 1996. The seed was broadcast on the site in accordance with the zones established for the wetland research.

Simultaneous with the site preparation in 1995 and 1996, seed was being hand-collected from several local wetlands. A species wish list was established by using data from the Minnesota County Biological Survey and other resources. Seed from the 1995 collections was grown out in the Horticultural Research Center greenhouses. Production efforts focused on the sedges, many of which are assumed not to establish well from seed in restoration situations. The propagules produced in 1995-96 were used to establish a raised-bed nursery in spring 1996. Approximately 30,000 plants were produced in the nursery, by dividing the original stock. An additional 35,000 seedlings were grown in the greenhouse in the winter of 1996-97 to be planted into the wetland in

May 1997. The bulk of the seed collected was used to dormant seed the site.

Management of the restoration will include aggressive efforts to control reed canary grass, cattails (*Typha spp.*), and purple loosestrife (*Lythrum salicaria*) in the meadow and wet prairie. Buckthorn (*Rhamnus cathartica*) populations in the upland are being managed. It is assumed that native plant communities in highly disturbed human environments are not able to sustain themselves without human intervention. Spring Peeper Meadow will continue to receive a high level of management for the foreseeable future; however, it is hoped that the level of management will decrease as the native, perennial plant community becomes established.

Research on the site focuses on the success of the re-establishment of sedges and associated wetland vegetation from seed versus from plant. Two treatments, seed only and seed supplemented with plants, are replicated three times across the site. In addition, the suite of plants introduced to the site are divided into three zones within each treatment:

- Lower Meadow - those species typically found growing in standing water;
- Upper Meadow - species typically found in saturated soils;
- Wet Prairie - species typically found growing in moist soils.

The Wet Prairie Zone functions as a buffer to the sedge meadow restoration.

Vegetation surveys will be used to determine the relative success of the two treatments in re-establishing a sedge meadow plant community. A survey conducted in 1998 documented the presence of over 190 plant species in SPM. Of 114 native species planted or seeded in the restoration, over 70 were recorded during the survey. The remainder of the species documented in the survey are introductions such as duck weed or weeds.

Other data collection efforts at the site include breeding bird surveys, amphibian chorusing and visual encounter surveys, seed bank studies, soil characterization, water sampling (temperature, alkalinity, dissolved oxygen, conductivity, and pH), and ground water movement.

Interpretation of the meadow is aided by the construction of a sturdy boardwalk transversing the wetland and the Gallistel Overlook placed on a hillside with a panoramic view of the wetland. Twelve colorful interpretive signs were designed by a graduate student and have been placed along the trail throughout the site. These thought-provoking signs explore the significance of wetlands, threats to wetlands, and other wetland issues and qualities.

Revegetation efforts on the 25-acre site continue with the restoration of tallgrass prairie, savanna and big woods in the uplands. In 1999, 5,900 trees and shrubs are being planted on the hillsides along State Hwy. 41.

To get to Spring Peeper Meadow, travel south on Hwy. 41 from Hwy. 5 and turn right on 82nd St. by the Mammoth Company. There is no fee to visit SPM.

Boulevard flowers

In April, the City of Minneapolis raised the maximum height for boulevard flowers from 24 to 36 inches, if they are more than 20 feet from an intersection. The limit is 18 inches within 20 feet of an intersection. Grass may be only 8 inches tall, but that may be changed. St. Paul allows boulevard plantings up to 24 inches tall.

Cost of invasive species

Exotic species cost the United States \$123 billion a year, Cornell University ecologists estimate. Professor David Pimentel said that alien weeds cost \$35.5 billion. The cost of purple loosestrife (*Lythrum salicaria*) is estimated at \$45 million a year for control, loss of forage crops, crowding out 44 native plant species and endangering wildlife that depend on the native plants.

Update on Acorns

by Catherine C. Reed

Last fall I collected acorns from St. Paul bur, red and white oaks. I soaked them for 24 hours and refrigerated them all winter, until it got warm enough to pot up them outside. White oak acorns germinated immediately in the refrigerator, bur oaks came later, and there are still (June) some red oak acorns that are in fine condition but just haven't sprouted yet.

Almost all the acorns sent out roots while still refrigerated, but I lost about 10 percent of the rooted acorns after they were potted. Some were eaten by a mouse (in my basement), others apparently rotted, some seemingly were destroyed by earthworms, while still others just vanished. Some potted seedlings outdoors were destroyed by squirrels which broke into my enclosures.

Despite these losses, I had about 1,100 fine potted seedlings about five inches high with 3 or 4 leaves by June. I have given away about 700 to restoration projects, schools and individuals. The rest are available — give me a call if you want any (651-644-3765).

This project was very interesting, and I look forward to this summer's acorn crop; last year's first acorns fell July 21. I will try not to let the project get completely out of hand this time.

Taxonomic note: In most books the bur oak, *Quercus macrocarpa*) or "big seed oak," is described as having the largest acorns of North American oaks. This was not the case in my backyard, where bur oaks had the smallest acorns of the three species. Another reference indicated that in the northern states the bur oak subspecies is *Q. m. olivaeformis*, noted for smaller acorns and a longer seed dormancy period.

Plant Lore

by Thor Kommedahl

What is pipsissewa?

Pipsissewa is *Chimaphila umbellata*, an evergreen, mycotrophic herb in the wintergreen family. "Chima" means winter and "phila" means love, so this plant loves winter. Pipsissewa may be derived from a Cree word meaning "it breaks it into pieces," referring to its use in treating gallstones.

Where does it grow?

It grows as a native in Minnesota in dry woodlands, especially on sandy (acid) soil near the Mississippi River in southern Minnesota north to northeastern Minnesota.

What does the plant look like?

It has dark, shiny, leatherlike, toothed leaves that radiate in whorls around stems that grow from creeping rootstocks. It has a cluster of waxy-white or pinkish flowers, each with a ring of reddish anthers. It is no taller than 10 inches.

Does it have any medicinal uses?

Its uses are similar to those of its relatives: bearberry, pyrola, and blueberry. Pipsissewa contains ursolic acid, and the glycosides arbutin, ericolin, and chimaphilin, all of which are excreted in the urine as disinfectant substances. A tea from leaves serves as a remedy for kidney weakness or chronic mild nephritis. It was listed in the U. S. Pharmacopeia and the National Formulary.

Are there any other uses?

Pipsissewa has been a traditional part of flavoring root beer. Leaves have been smoked as a substitute for tobacco.

Can it be grown in wild gardens?

Hortus Third reports its culture in wild gardens in partial shade. It can be propagated by division of rootstocks.

Plant-of-the-month

Northern white cedar or arbor-vitae

by Meredith Cornett

Thuja occidentalis is a coniferous tree belonging to the *Cupressaceae* family. *T. occidentalis* has at least two common names: northern white cedar, used most often by ecologists and natural resource professionals, and arbor-vitae, used most often by gardeners and the nursery industry.

Arbor-vitae is poor Latin for “tree of life.” True to its name, *T. occidentalis* has a long life expectancy, up to 200 to 300 years in many habitat types. On the Niagara Escarpments of southern Ontario, the life expectancy of *T. occidentalis* is as high as 500 to even 1,000 years. The oldest individual found in these vertical, stunted forest communities was 1,600 years old.

T. occidentalis is also historically a life-giving tree. Jaques Cartier was impressed by the medicinal value of *T. occidentalis*. After his voyage up the St. Lawrence River in the mid-16th century, *T. occidentalis* became one of the first plants to be introduced to Europe. Cartier’s scurvy-ridden crew is thought to have been saved by a tonic prepared from the bark and foliage of *T. occidentalis*. The tonic was prepared by one of the crew members, Domagaia, a native American who was familiar with the medicinal uses of the local flora.

The native range of *T. occidentalis* is from Nova Scotia to Manitoba, south through northeastern Minnesota and across to the northeastern United States. Some outliers occur in Ohio and the limestone Alleghenies. *T. occidentalis* grows both in mono-dominant stands and as a component of several forest types.

In Minnesota, *T. occidentalis* dominates two major forest communities, including white cedar

swamps and upland white cedar forests, each with its own distinct complement of ground flora. Cedar swamps are fairly common in the northeastern portion of the state’s conifer-hardwood zone, with scattered stands in the deciduous forest-woodland zone that stretches in a band from northwest to southeast across the state. Upland white cedar forests are less common than swamps, but significant examples can be visited on the north shore of Lake Superior, especially in the state parks. A few examples also occur in the southeastern part of Minnesota, along the Mississippi River. Upland white cedar forests on many of these sites are well over 100 years old, with many over 200 years old.

These old-growth forests are in fire-protected areas that escaped logging in the early 1800s. There are a number of conservation concerns related to white cedar growing in these communities. For example, they are a favored browse species for such animals as white-tailed deer and snow-shoe hare. Virtually all of the young cedar are being consumed by herbivores in many parks and reserves along the north shore of Lake Superior, which means that there is no younger generation to replace the older trees as they die.

T. occidentalis produces seed in the fall, with a heavy crop every three to five years. The seed needs to be chilled before it will germinate. A two- to three-week period of cold, dry chill is sufficient to enhance germination, as opposed to the several months of cold, moist stratification required by many other conifers.

T. occidentalis is extremely slow-growing, and germinants and seedlings bear little resemblance to mature trees. In the year of

germination, the first immature needle-like leaves appear, giving the plant a bottle-brush appearance. In a shady forest setting, growth can be as slow as 1 cm each year for the first several years. The first scaley adult leaf appears between the third and fifth year of life. A late successional species, *T. occidentalis* often establishes best in the wild on disturbed seed beds, such as exposed mineral soil or decayed logs. Reproduction by layering, a process in which branches that make contact with the soil sprout roots and produce a new tree, also occurs in natural settings.

Cultivars of *T. occidentalis* are widely used in home landscapes throughout much of eastern North America. Many of these cultivars are bred to grow outside the native range of *T. occidentalis*, as around the Twin Cities area. In these urban and suburban settings, *T. occidentalis* is often maintained as a shrub, attractive in many instances but different in character from its majestic, enchanted appearance in native plant communities.

Meredith Cornett is community forest ecologist for the Minnesota Department of Natural Resources, Division of Forestry.

Shoes that last and last and last

Sandals and slip-ons made from rattlesnake master (*Eryngium yuccifolium*) have survived for 1,000 to 8,000 years.

Since 1955, 35 shoes have been found in a cave in Missouri, and almost all were made from rattlesnake master.

According to an article in the January 1999 National Geographic, some of the shoes were found by Michael O’Brien, a University of Missouri archaeologist.

He called the shoemakers “skilled craftsmen who knew what they were doing.” He was surprised that the same plant was used to make the shoes over a period of at least 7,000 years.

Plant-of-the-Month Butternut

by Kent Honl

To those who object to deposits of "litter" in the form of nuts and leaf stalks on lawns and sidewalks, the butternut (*Juglans cinerea*) is not prized as a landscape tree. To those less fastidious and more adventurous, the Butternut is an often overlooked gem.

The native range of butternut covers most of the eastern United States and southeastern Canada; it is the hardiest of the edible nut-bearing trees. I have seen specimens as far north as Duluth and Park Rapids. Few, if any, other species of nut-bearing trees can provide delicious nuts and thrive this far north.

Butternut meats are easier to extract from the shell than those of the hard and stubborn black walnut. Children especially seem to enjoy the ritual of cracking out nuts they have helped to collect. Though the nuts are rich and oily, they store very well and will not turn rancid if kept in their shells in a cool place.

Butternut wood closely resembles black walnut in its grain and texture, but is softer and lighter in color. The wood of both species is a joy to the woodworker; it yields to edge tools as if it wants to be carved. An open-grown butternut tree displays beautiful smooth, gray bark and a pleasing low, broad silhouette in winter.

Throughout its entire range, disease threatens the survival of the butternut. An incurable canker disease caused by the fungus *Sirococcus clavigignenti-juglandacearum* has destroyed up to 80 percent of the butternut trees in states farther south and east of Minnesota.

Butternut canker can be identified as sooty black patches of sunken bark with ragged edges; they are often visible in multiple areas of the main trunk, where they coalesce to

DNR study identifies prairies on railroad rights-of-way

The Minnesota DNR has completed a field review of active railroad rights-of-way to identify native prairie. The study also identified and assessed management practices used to control vegetation on the railroad ROW. Steven Merchant was coordinator of the two-year project, which was requested by the 1997 Legislature.

Minnesota County Biological Survey methodology was used. The survey was restricted to those regions of Minnesota that contained the largest portion of prairie vegetation before railroads were first constructed. 3,240 miles of railroad ROW were surveyed; 487 discontinuous miles of native prairie were identified. No prairie was found on 84 percent of the surveyed ROW. Four percent contained very good prairie. Good and fair prairie were each found on 6 percent. Seventy-eight percent (380 miles) of the identified prairie is mesic, which is now one of the rarest types in the state.

The survey found 137 new locations of rare plant and animal species. These included one location of a regal fritillary (a special concern species);

girdle and kill the tree. All butternut trees appear to be uniformly susceptible to the canker disease. This should not, however, discourage tree enthusiasts from planting butternut where space is available in suitable sites. Decimated populations need to be restocked to maintain the hope that resistant individuals will show up.

The U.S. Forest Service leads research efforts to identify trees resistant to butternut canker. Butternut may well go the way of the American chestnut if resistant trees are not found. If you locate mature, non-infected butternut trees in an area with butternut canker, please contact the U.S. Forest Service at the North Central Experiment Station, 1992 Folwell Ave., St. Paul, MN 55108.

one state endangered plant, and nine different species of state threatened or special concern plants.

The prairie bush clover (*Lespedeza leptostachya*) is on both state and federal threatened lists. The tubercled rein-orchid (*Platanthera flava* var. *herbiola*) is the state endangered plant that was found. State threatened plants were: tuberous Indian-plantain (*Arnoglossom plantagineum*), Sullivant's milkweed (*Asclepias sullivantii*), and valerian (*Valeriana edulis* var. *iliata*). The state special concern plants found are white wild indigo (*Baptisia alba*), plain's wild indigo (*Baptisia bracteata*), small white lady's-slipper (*Cypripedium candidum*), rattlesnake master (*Eryngium yuccifolium*), and blanket flower (*Gaillardia aristata*).

Fourteen railroad companies have prairie remnants in their ROW, but 10 companies own 99 percent of the identified prairie. Officials from four railroad companies and a representative of the Minnesota Regional Railroad Association have had two meetings with the DNR; four working groups were formed Dec. 16, 1998. They will continue to meet and address interagency coordination, technical assistance, management and public awareness.

To obtain a copy of the report, call Lori Biederman at 651-282-2509.

Join the speakers' bureau

Harriet Mason is organizing a MNPS Speakers' Bureau. Members living throughout Minnesota are urged to volunteer to talk to a few groups. Anyone interested should call her at 507-931-3253. or send her an e-mail at cmason@gac.edu.

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